Volume XXVIII.
Number 6.

MARCH, 1905.

$2.00 per year.
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TEXTILE WORLD RECORD

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The Textile-Finishing Machinery Co.

17 EXCHANGE PLACE, PROVIDENCE, R. I.

Mercerizing Machinery for Piece Goods and Yarn in the Warp or Chain

Singeing Machines,

Boiling Kiers,

Washers, Squeezers,

Chemic and Sour

Rusden Patent

Continuous Chainless

Steamer,

Aniline Agers,

Dyeing Machines,

Open Soapers,

Blanket Washers,

Color Kettles,

Horizontal or Vertical Drying Machines, with Copper or Tinned Iron Cylinders,

Automatic Tentering Machines,

Water and Starch Mangles,

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Dyeing Machines for Chain Warps.

BUILDERS OF ALL KINDS OF

MACHINERY

FOR

BLEACHING
DYEING
DRYING

AND

FINISHING

Calenders for Rolling, Glazing, Chasing and Embossing, also Callenders for Moire Finish.

Sole Manufacturers of Patented Flexible Cloth Expander for Cylinder Drying Machines, Calenders, Mangles, &c.

Patent Combination Rolls Made of Cotton and Husk, especially adapted for Soft Finish, Unequalled for Elasticity and Durability.

Cotton, Paper, Husk, Chilled Iron, Brass and Rubber Rolls, Electro-deposited Copper Rolls for all Purposes.

Padding and Drying Machines for Shade Cloths.

Single and Double Cylinder Engines.

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ALL KINDS OF OUTFITS FOR BLEACHING THREAD AND SOFT TWISTED YARN.
BLEACHING MACHINERY FOR YARNS IN THE WARP OR CHAIN.

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Open Bleaching System

OF

JACKSON & HUNT

Patented in the United States, Great Britain and the Continent
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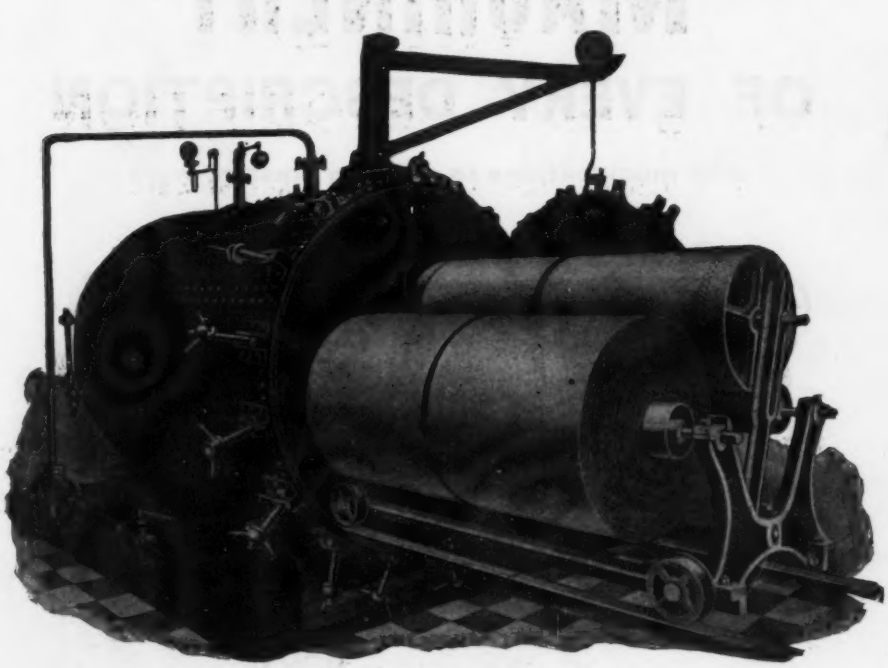

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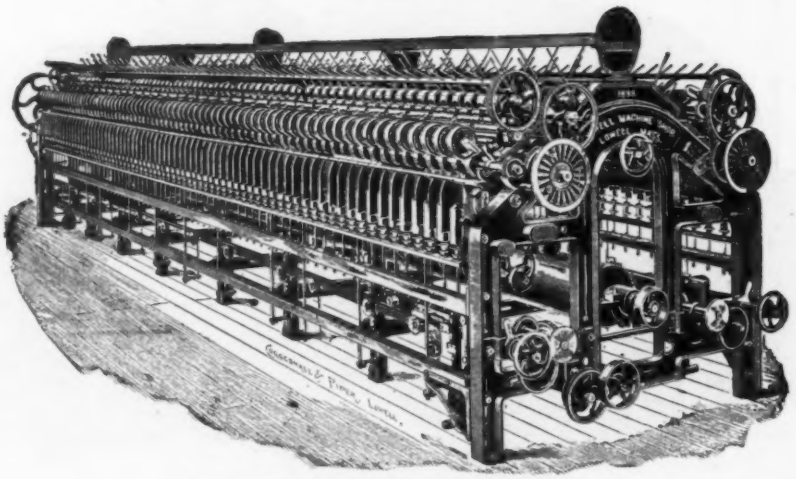
AMERICAN WORSTED MACHINERY

OF EVERY DESCRIPTION

with modifications to suit any class of work.



WORSTED CAP SPINNING FRAME.

Flyer and Ring Spinning Frames, Dandy Rovers and Reducers, Cone Second Finishers, Reducers and Rovers, Gill Boxes for Drawing, Preparing and Finishing, Weigh Boxes and Drawing Boxes, Cap Trap, Flyer and Ring Twisters.

Specifications and Estimates Furnished Upon Application.

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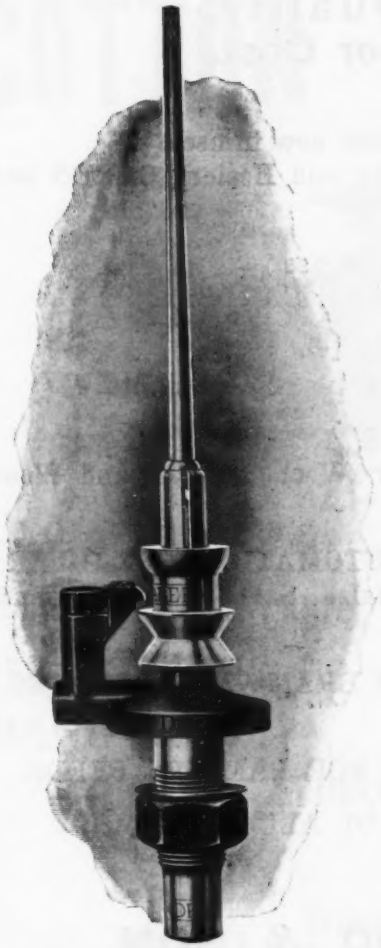

The Rabbeth Centrifugal Bobbin Clutch.

Fits the Bobbin loosely when at rest—allows considerable variation in fit.

Bobbins will all go down into place and Traverse can be lengthened.

Allows easier and quicker doffing — stronger bobbins — less reaming.

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Increases Production,
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THE BRAMWELL FEEDER (over 12,000 now in use.)
For Woolen, Worsted, Shoddy and Hosiery CARDS and GARNETT Machines.

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For Second Breaker and Finisher CARDS.

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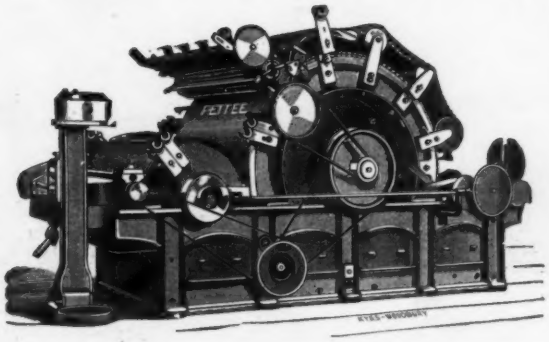

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Cotton Machinery

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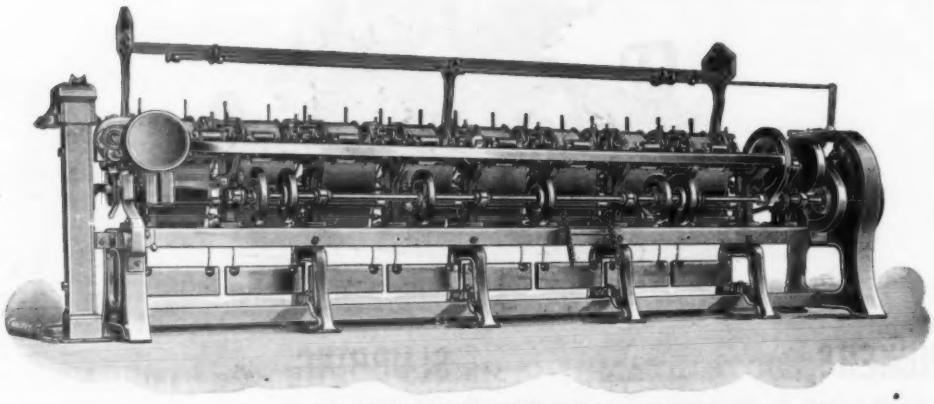

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Revolving Flat Carding Engines,
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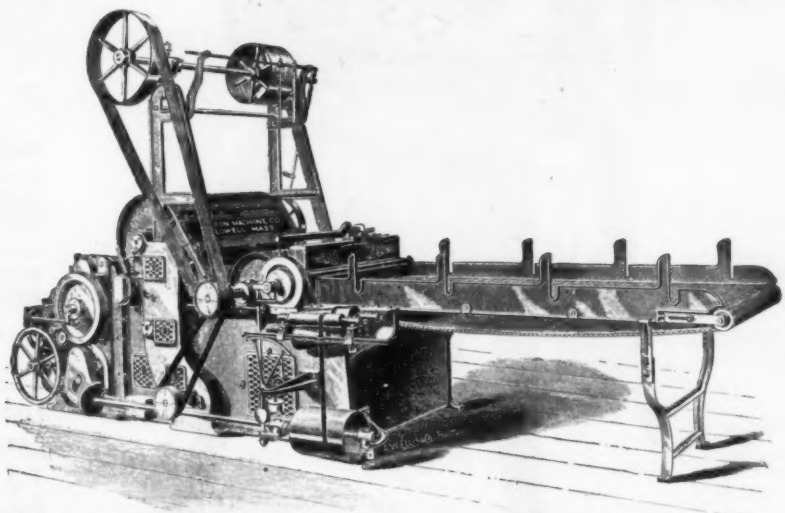
The Best Pickers

In the Cotton Field nothing equals the DARKY COTTON PICKERS.



In the Cotton Mill nothing equals the KITSON COTTON PICKERS.

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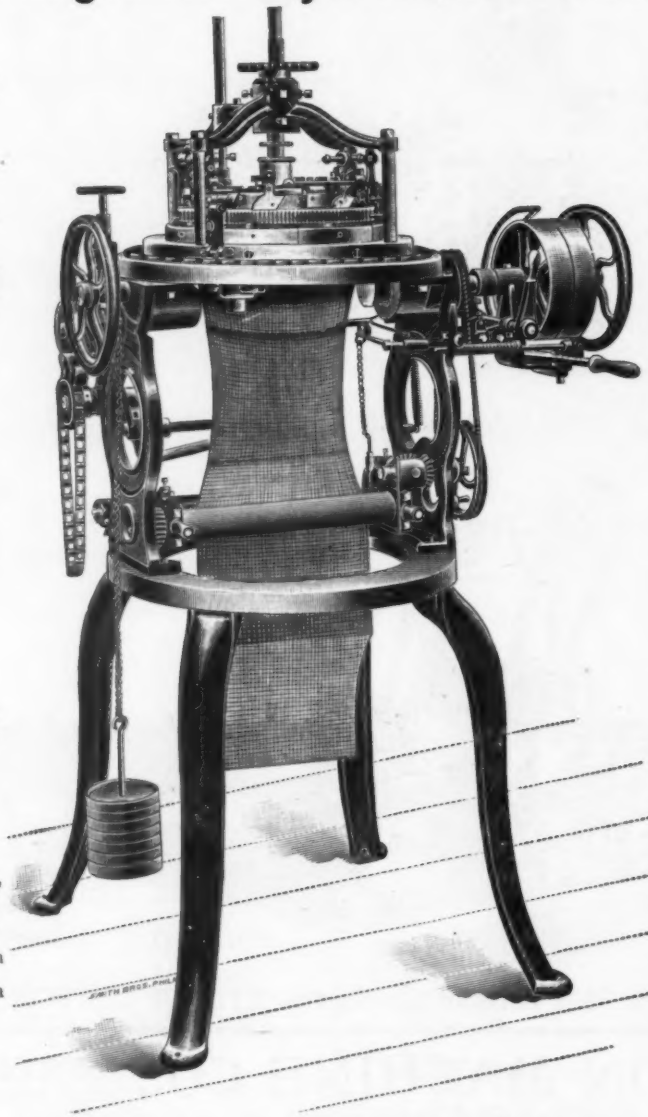
BUILDERS OF

Rib Knitting Machinery for Underwear and Hosiery

The illustration shows our

Improved High Speed Single Lever Automatic Ribbed Underwear Machine

for making ladies' and gents' ribbed underwear, union suits, etc., plain and shaped.



Plain, Single Lever or with Welt, Slack Course and Automatic Slackening Device for Welt.

Improved Measuring Device, by actual length knit.

Sizes, 8 to 24 inches, inclusive, varying by one inch.

Number of Feeds, four to 12, according to style and diameter of machine.

Solid Forged Steel Cylinders, specially hardened or with patent inserted walls for fine fabric.

Special Machinery for Sweaters etc.

We build Loopers, Ribbers and other Machinery for Knitting Mills

As well as

A Complete Line of Full Antomatic and 7-8 Automatic Seamless Hosiery Machinery.

Full Particulars, Samples and Special Catalogues on Application.

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AUTOMATIC KNIT-TERS

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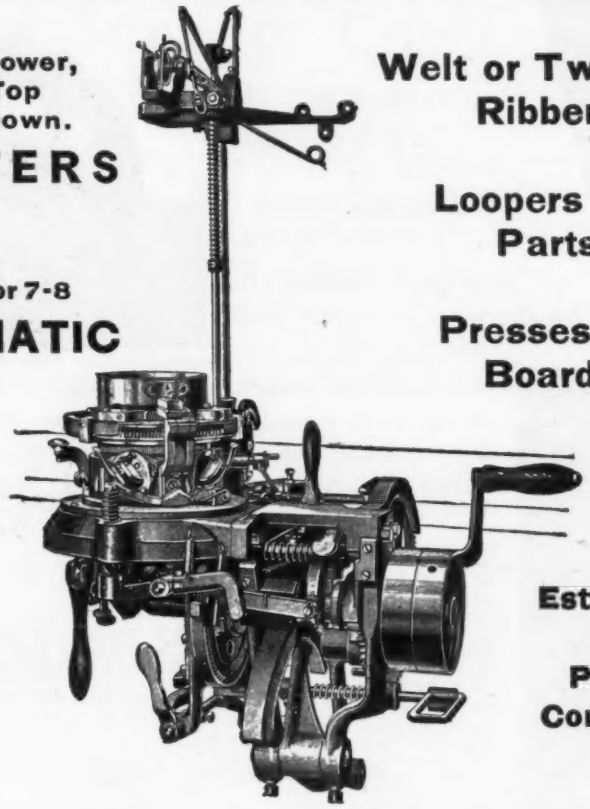

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Presses and Boards.

Estimates for Plants Complete.

Winders and Bobbins. Hand Forged Steel Cylinders.

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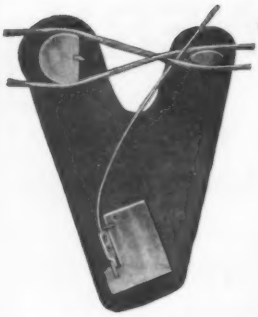
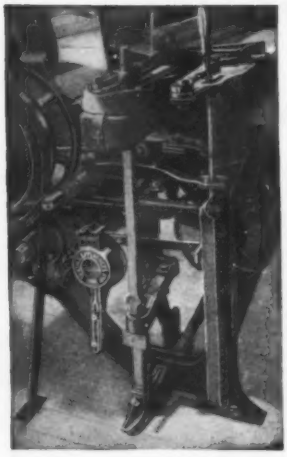
Write for information and Catalogue.

Absolute Efficiency from Bed-Rock Simplicity

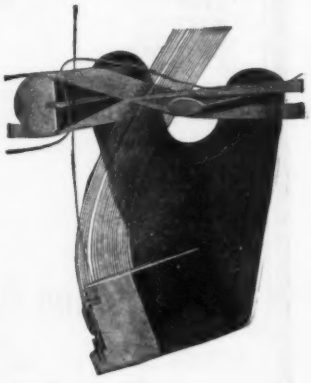


Our **WARP-STOP** controls
TWO threads by ONE spring WIRE, held in a COMB,
engaging the warp
in such a way that
the TENSION is UNDER CONTROL,
and
ABRASION of the yarn is AVOIDED.

The COMBS are RAPIDLY INSERTED, BEFORE or AFTER the warp is in the loom,
and are carried in a
bar suspended from **the LEASE-RODS** which **ARE NOT FIXED** to the loom side, but **FREE to take their proper positions,** and **ALLOW the NATURAL MOVEMENT of the WARP,** so that **the COVER of the cloth is UNAFFECTED.**



When a thread breaks the WIRE SPRINGS OUT from the comb, thus giving
a CLEAR SIGNAL of the place of the BROKEN END,
and, by striking
a CONTACT SLIP upon which LINT CANNOT COLLECT,
closes the circuit through
a PERFECT KNOCK-OFF, EASILY and RAPIDLY FIXED, and **actuated by a SPARKLESS current.**



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SOLE AGENT IN THE UNITED STATES AND CANADA FOR

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BY FAR THE LARGEST MAKERS IN THE WORLD OF

Cotton, Woolen and Worsted Machinery

Platt's Patent Opening and Picking Machinery.
Platt's Cotton Comber will comb from 7-8″ stock to Sea Islands.
Platt's Special Machinery for Making Cotton Waste into Yarns.
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Platt's Cotton, Cotton Waste, Woolen and Worsted Mules.

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Dyeing and Finishing Machinery. Archbutt-Deeley System for purifying and softening water.

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Flax, Hemp and Jute Machinery.

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Patent Feeding Machines for wool, cotton, flax, fur and fibrous material

GEORGE HODGSON, LTD.

Looms for Worsteds, etc.

JOSEPH SYKES BROS., Card Clothing for Cotton.

JAMES CRITCHLEY & SON'S, Card Clothing for Woolen and Worsted.

DRONSFIELD BROS'. Grinding Machinery and Emery Filleting.
The Best French and English Combing and Rubbing Aprons.
Harding's Pins and Circles, Varey's Fallers, etc.

NOT ONLY
THE LATEST
BUT ALSO THE
SIMPLEST and BEST.

THE CAMLESS WINDER.

For Cones and Tubes.

Send for Descriptive Circular.

The A. T. ATHERTON MACHINE CO.

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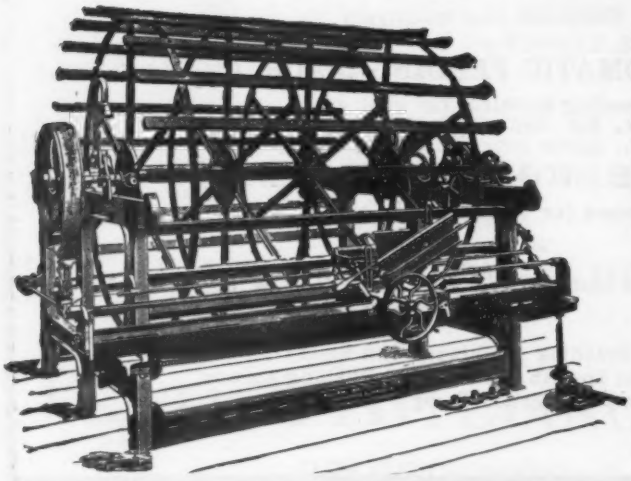

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Makers of all descriptions of Tentering and Drying Machines.

Moore & Whiteley's Patent Wool and Cotton Dryer.

Crabbing or Winding-on Frames.

Cross Raising Machines, Wool Scouring Machines,

Hydro Extractors. Warp Sizing.

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Warping Mills with Patent Sectional Dividing Apparatus.

Self-Acting Mules. Bobbin or Pirn Winder, &c., &c.

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Second-hand Tentering Machines in good repair at low prices.

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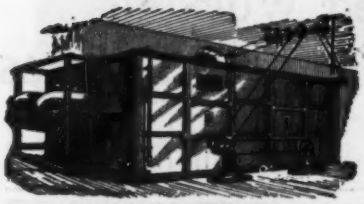
For WOOL, COTTON STOCK, YARN, STOCKINGS, UNDERWEAR, Etc.

Truck Yarn Dryer.

Write for Booklets.

"Hurricane" Fan, Style No. 2.



Cotton Stock and Wool Dryer.

CARBONIZING,

BLEACHING,

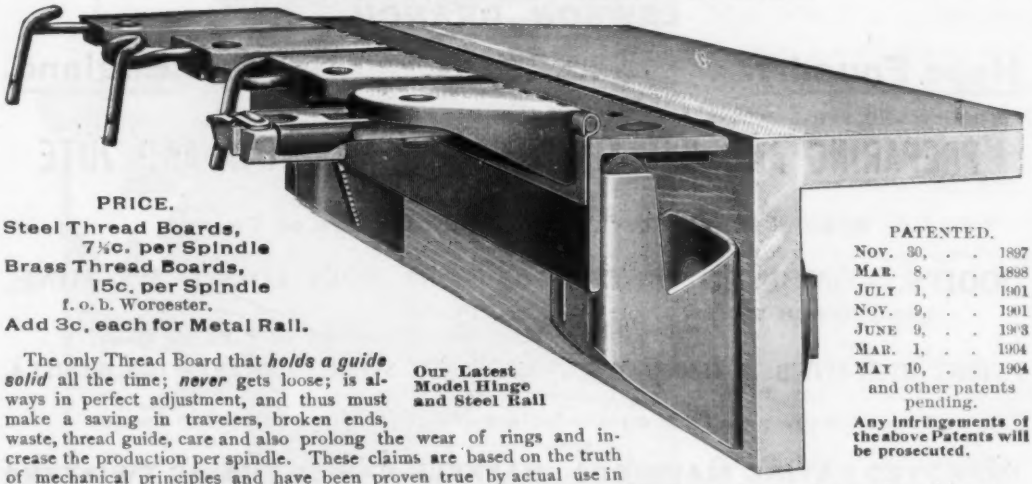
OXIDIZING, CHROMING and WASHING MACHINERY.

PHILADELPHIA DRYING MACHINERY CO.

6721 Germantown Ave., Philadelphia, Pa.

HOUGHTON'S ALL STEEL THREAD BOARD

With Hardened Thread Guides.



Our Latest Model Hinge and Steel Rail

PRICE.

Steel Thread Boards, 7½c. per Spindle

Brass Thread Boards, 15c. per Spindle

f. o. b. Worcester.

Add 3c. each for Metal Rail.

PATENTED.

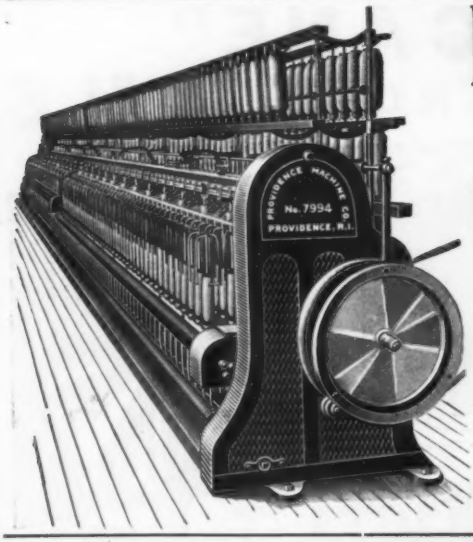
Nov.	30, . .	1897
Mar.	8, . .	1898
July	1, . .	1901
Nov.	9, . .	1901
June	9, . .	1903
Mar.	1, . .	1904
May	10, . .	1904

and other patents pending.

Any infringements of the above Patents will be prosecuted.

The only Thread Board that ***holds a guide solid*** all the time; ***never*** gets loose; is always in perfect adjustment, and thus must make a saving in travelers, broken ends, waste, thread guide, care and also prolong the wear of rings and increase the production per spindle. These claims are based on the truth of mechanical principles and have been proven true by actual use in many mills, whose superintendents will substantiate these claims. Write for list of mills using our Thread Boards.

L. T. Houghton, Sole Manufacturer, Worcester, Mass.



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Improved Worsted Roving Frames

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MAKERS OF MACHINERY FOR

PREPARING AND SPINNING FLAX, HEMP, TOW AND JUTE

AND OF

Special Machinery for the Manufacture of Twines,

ALSO OF

GOOD'S COMBINED HACKLING AND SPREADING MACHINE,

LONG REACH SCREW-GILL DRAWING FRAMES,

CHAIN-GILL DRAWING FRAMES with Apron Head,

PATENT HIGH-SPEED HORIZONTAL AND AUTOMATIC SPINNING FRAMES FOR MANILLA,

AND OTHER

Special Machinery for the manufacture of Rope Yarns and Binder Twine.

IMPROVED LAYING MACHINES. HASKELL-DAWES TUBING TWISTERS

BROWNELL'S PATENT TWISTING AND LAYING MACHINES FOR TWINE.

Complete Plans and Estimates for Flax, Tow, Hemp and Jute Mills, Trawl Twine Factories and Steam Ropeworks.

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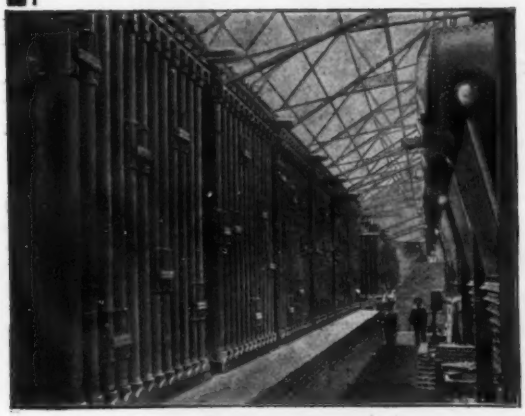

has demonstrated a Saving in

Textile Mills, Bleacheries, Dye Works,

that has not been duplicated by any other machine invented in recent years.

Saving in coal,
Increased steaming capacity,
Saving in labor in handling coal and ash,
10 to 15 %

These are only a few of the things we accomplish.

Send for Catalog.

The Green Fuel Economizer Co.,
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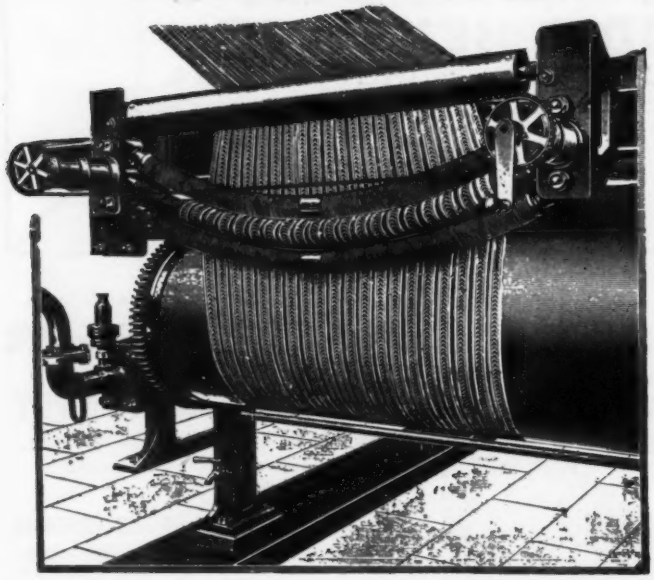
ERFECT CLOTH EXPANDER



The recent invention of Wm. Mycock, an English cotton manufacturer. Hundreds sold in Great Britian and on the Continent. Large bleacheries in this country where it has been placed on trial are delighted with it. Gets the full width of goods, with perfectly even tension both ways. Can be attached to calenders or cans. Put it on trial.

Patented in United States, Canada, Great Britain and Continental countries. Infringements will be prosecuted.

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"STEEL MIXTURE"
BOILER DOOR ARCHES AND FIRE BOX BLOCKS
TONGUED & GROOVED
PATENT BACK COMBUSTION CHAMBER ARCH
ARCHES MADE FOR ONE OR MORE DOOR OPENINGS
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INQUIRIES SOLICITED
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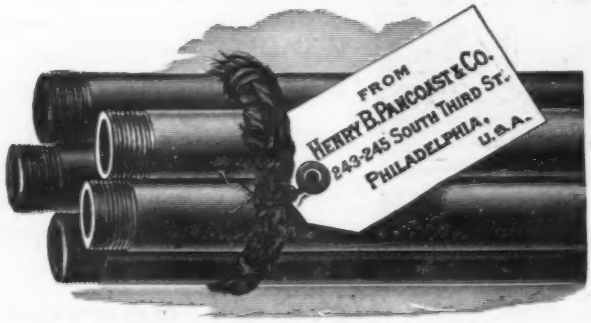

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WROUGHT AND CAST IRON PIPE

for steam, water and gas.

BRASS, COPPER AND LEAD PIPE.

Iron and Brass Fittings, Valves, Etc.
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Steam and Hot Water Heating Apparatus.

Steam Specialties, Pipe Fitters' Tools, Etc.

PIPE CUTTING A SPECIALTY.

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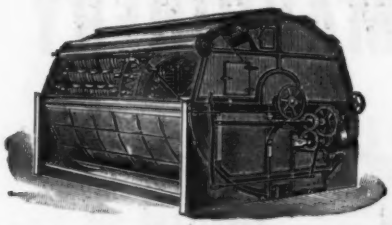
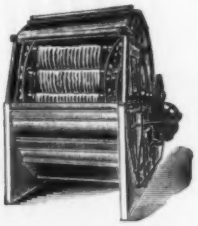


SAVES

75% in Labor.
30% in Winding.
Steam and Dye Stuffs.
No Friction.
No Tangling.

CAPACITY
50 to 700 lbs per batch.



THE KLAUDER-WELDON DYEING MACHINE CO.

AMSTERDAM, N. Y.

Builders of Machines

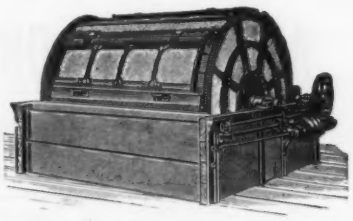
For Skein—Worsted, Slubbing, Cotton and Silk.
" " and Warp Mercerizing.
" Raw Stock Cotton, Wool, Waste and Rags.
" Garments Underwear, Hosiery and Caps
" Sulphur Colors—Raw Stock, Skein and Hosiery.

RAW WOOL AND COTTON MACHINES.

CAPACITY
200 to 1000 lbs per batch.

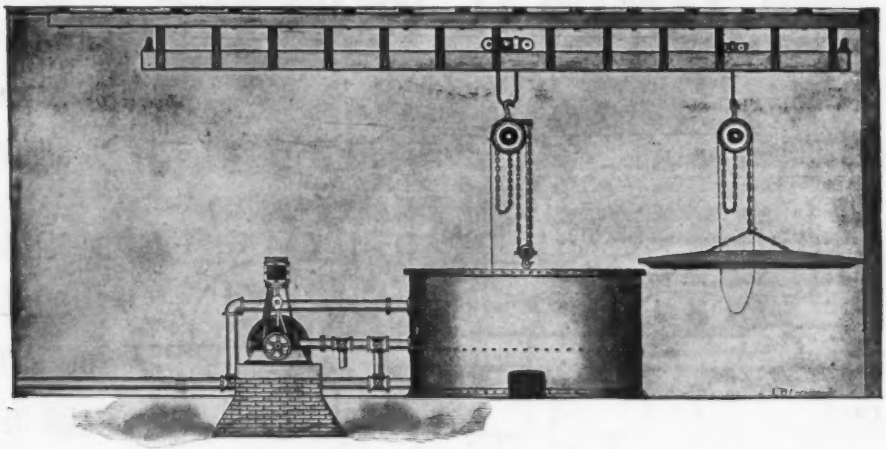
SAVES

50% in Labor besides Steam and Dye Stuffs. Practically indestructible. Leaves stock in perfect condition.



VACUUM DYEING MACHINE CO., CHATTANOOGA, TENN.

RAW STOCK, YARN AND HOSIERY DYEING MACHINES



OFFICE OF TREMONT & SUFFOLK MILLS, LOWELL, MASS., Jan. 14, 1904.

VACUUM DYEING MACHINE CO., Chattanooga, Tenn.

GENTLEMEN: Replying to your inquiry in regard to what we think of your Raw Stock Dyeing Machine, would state that we have been using one about six months, with very satisfactory results, the dyeing being level, and the stock left in first-class condition for spinning. Can give your machine no better recommendation than to say, we think so well of it that we have just placed an order for two additional machines.

Yours truly J. J. CONNELL, Agent.

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MACHINERY
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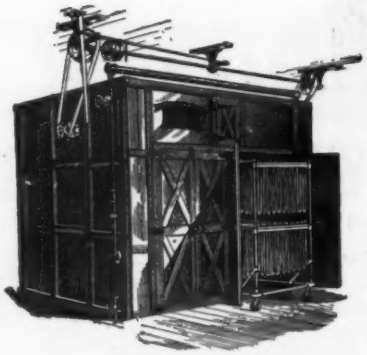

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CONTINUOUS SYSTEM FOR BLEACHING COTTON STOCK.
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Is a Great Success.

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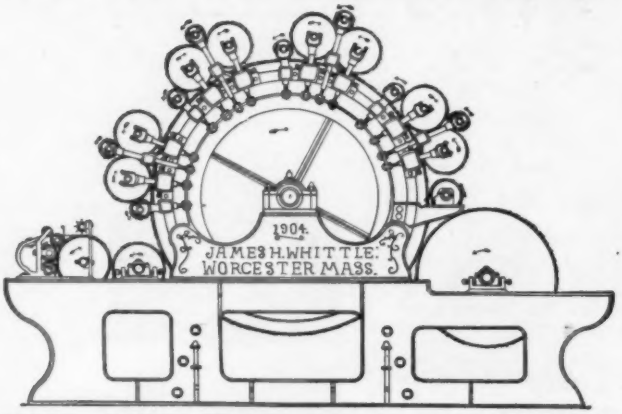

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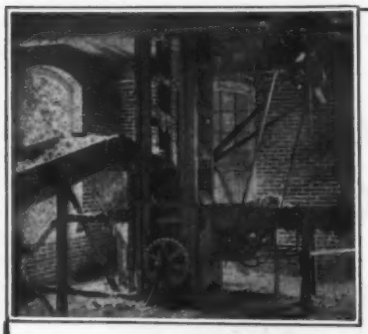

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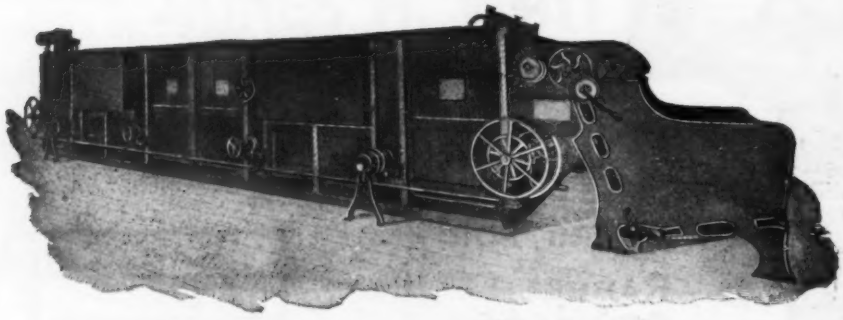

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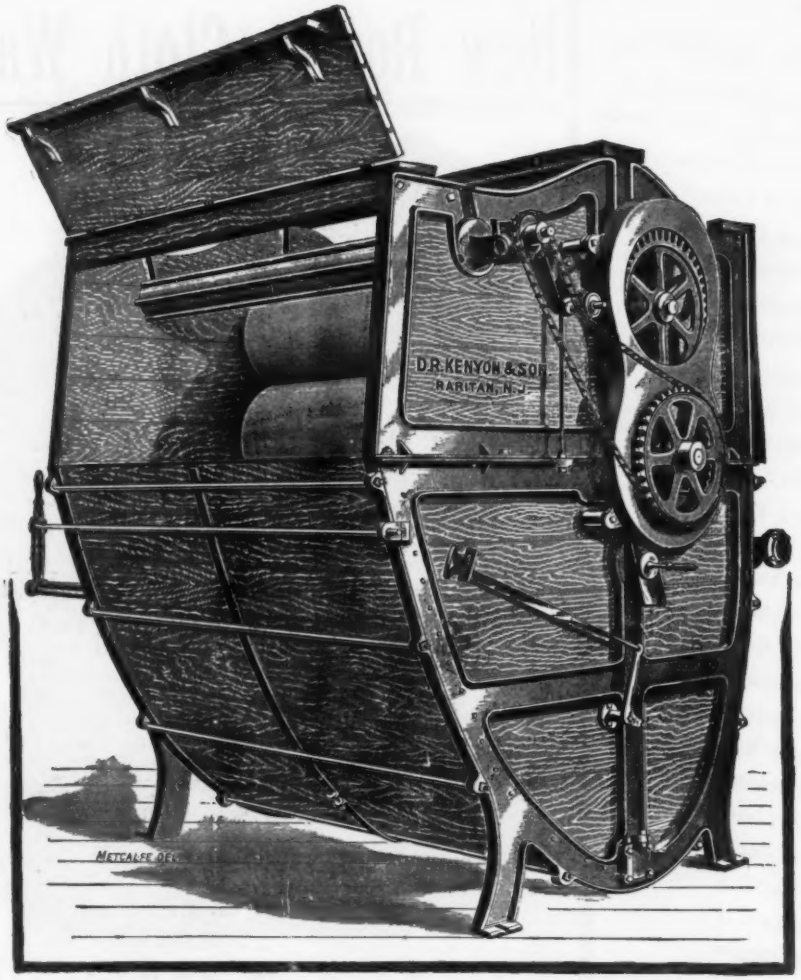

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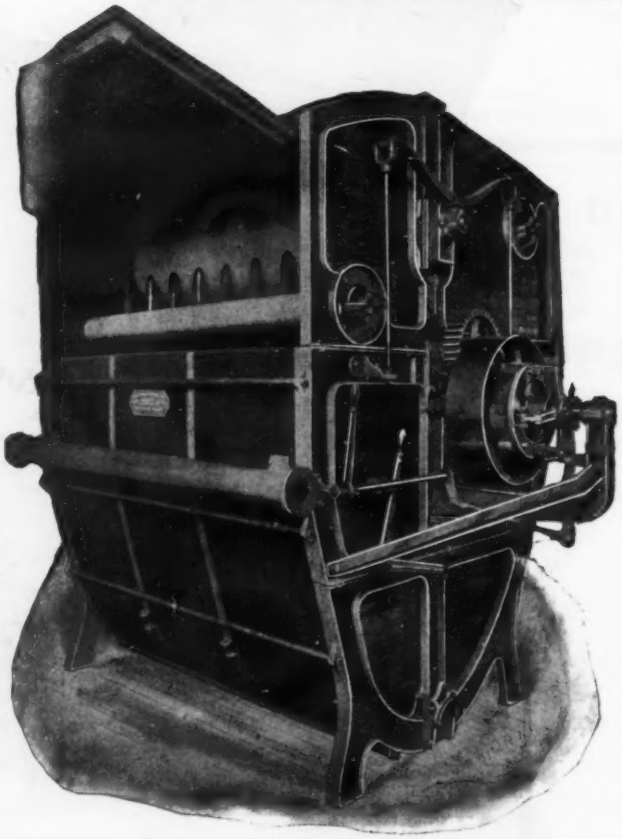

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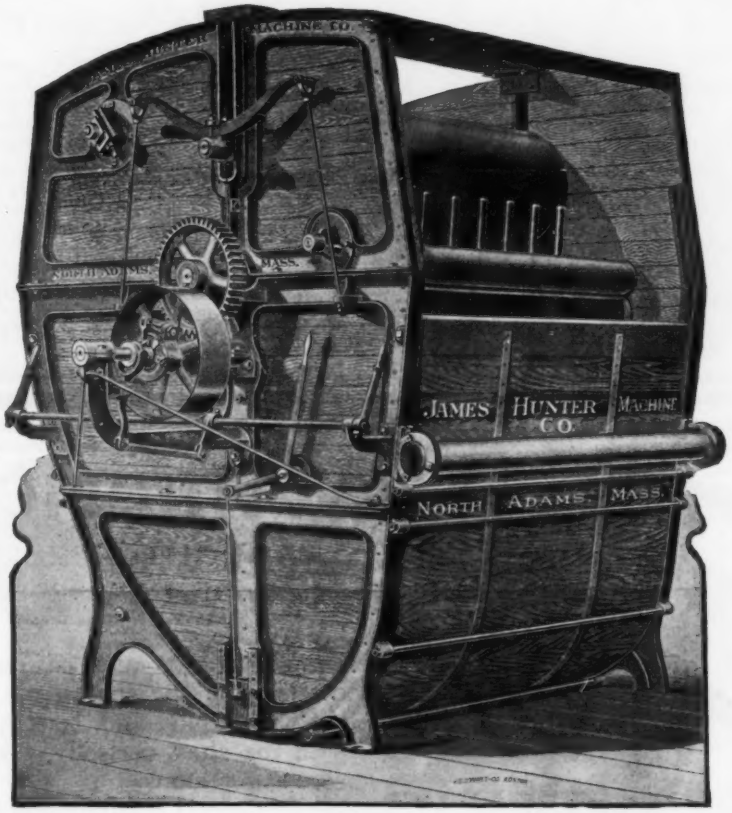

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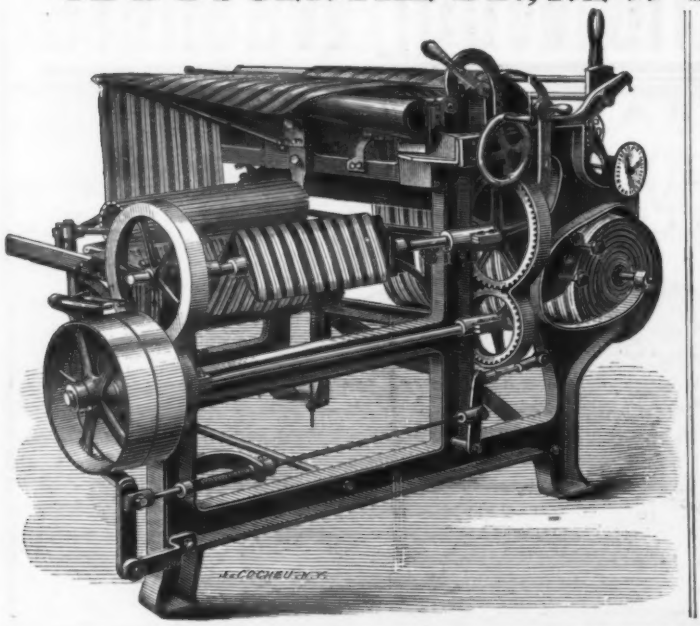

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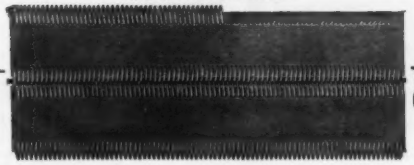

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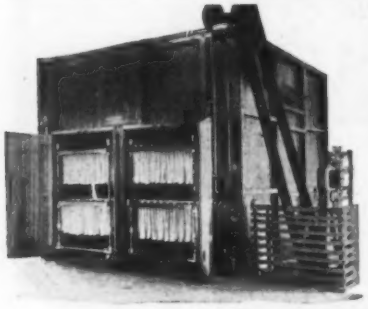

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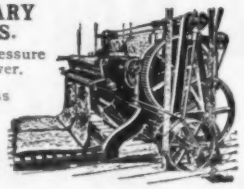

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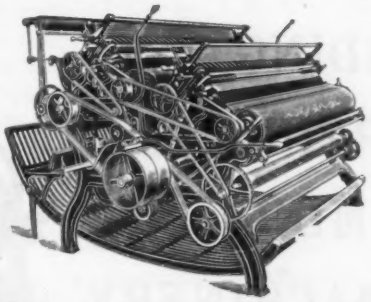

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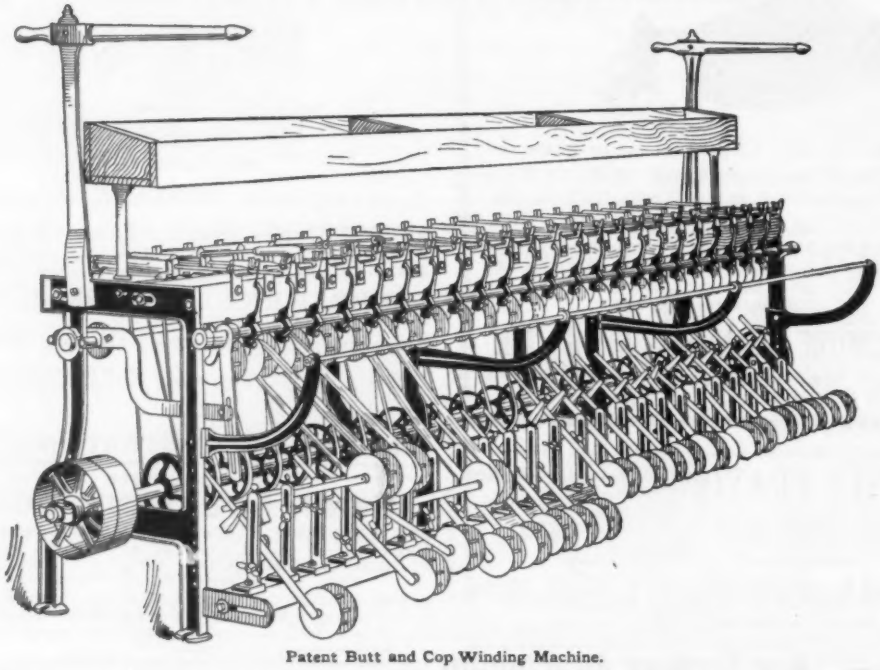

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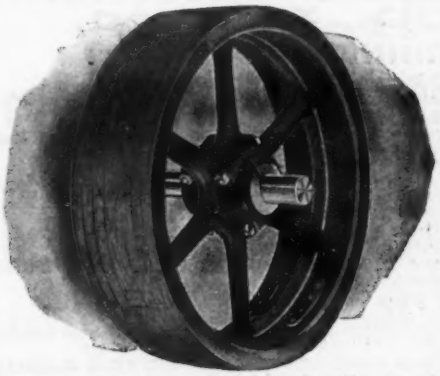

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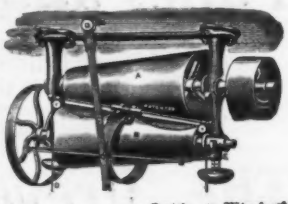

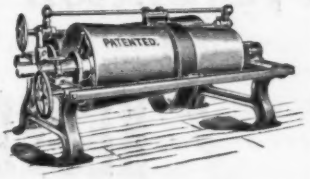

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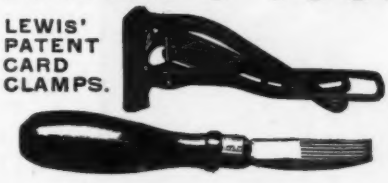

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For Setting Up Bent Teeth of Card Clothing with a variety of all other tools used by Carders and Manufacturers. Send for circular.

W. H. BROWN, No. 81 Mechanic Street, WORCESTER, MASS.

Elliot Cloth Folder and Measurer

FOR COTTON, AND GINGHAM MILLS, BLEACHERIES, PRINT WORKS, ETC.

MANUFACTURED BY

ELLIOT & HALL, 54½ Hermon St., Worcester, Mass

Send for Circular.

SILK MILL SUPPLIES

OF EVERY KIND AND DESCRIPTION

Also Power Transmission Supplies for General Mill Use.

I. A. HALL & CO.
Paterson, N. J.

Allentown Reed, Harness and Mill Supply Co., Allentown, Pa.

Mr. SUPERINTENDENT

DEAR SIR: Did you ever stop to consider the immense amount of WASTE your combers are making? Do you realize the profit the JUNK man is making on this waste?

Why not let us reflute your detaching rolls and make new top rolls of solid brass with cast-steel hardened ends or bearings. You can then speed up your combers, get more production, and less waste.

Send us your detaching roll, we will fix it for you and make you new top rolls; it will not cost you a cent, and we think it is worth trying.

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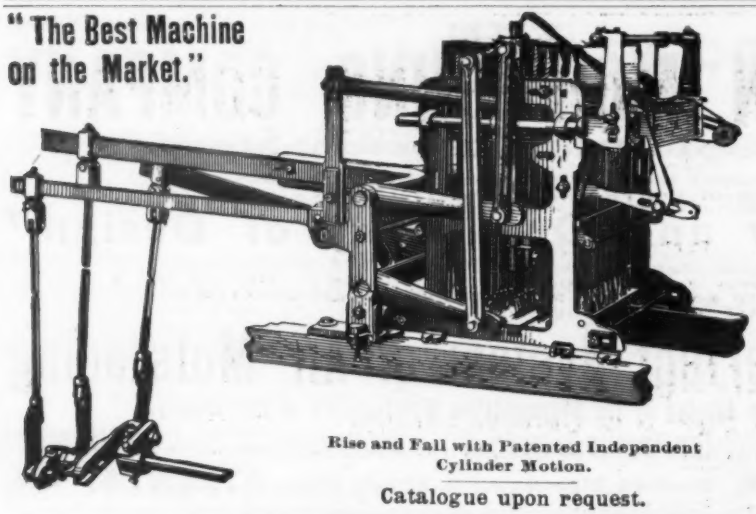
Note—We have thousands of Bodden flyers in stock, sizes 6, 7 and 8 in. Prices way down.

"The Best Machine on the Market."



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Original Fine Index Machines

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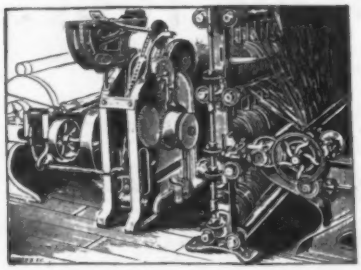

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With all the latest improvements for Wool Cards. The latest and best and only Feed that will make yarn positively even.

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CHOQUETTE WASTE SAVER. Saves card fly.

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STEAM USERS of this country have upwards of 90,000 Steam Boilers under the inspection and insurance supervision of this company.

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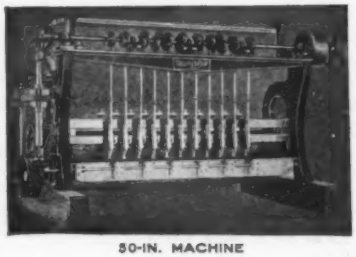

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L. F. FALES

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FOR ALL PURPOSES WHERE A NUMBER OF ROWS OF SEAMS ARE REQUIRED

BUILT WITH ANY REQUIRED NUMBER OF NEEDLES.

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And PATENT EXPANSION COMBS For Warpers, Beamers and Slashers.

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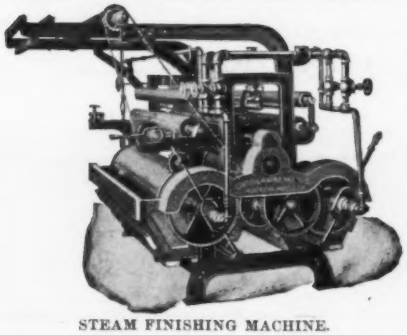
CLOTH FINISHING MACHINERY



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The ROY and the HARDY
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For grinding every make and style of Card, Napper, Garnett, Calender, Shear, etc.

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Special Machinery Built General Machinery Repairs
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We are consulting engineers in ventilating, heating, cooling and drying problems, and experts in air, steam and all vapor moving.

We first like to know what you want to accomplish, or what the trouble is. Selling a fan alone is often unsatisfactory—the study of each case, to know the conditions, location, proper size, speed, etc., are of vital importance.

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Drying Capacity Can Often Be Doubled

With very little expense, and by utilizing the same machinery if you know how to move the moisture. That's our business.

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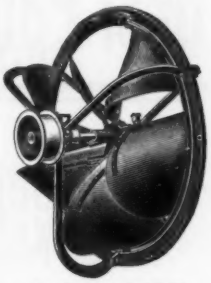
Four Walls and No Roof.

An old woolen manufacturer who was once asked how to plan a dye house so there would be no trouble from steam, answered that the only way was to build four walls and leave off the roof so the steam could get out.

He wouldn't say so today if he had seen the scores of dye houses where we have successfully cured the steam nuisance. If interested, write.

This is the Berry Wheel, the most efficient agent for moving air, eliminating steam and other impurities in the atmosphere.



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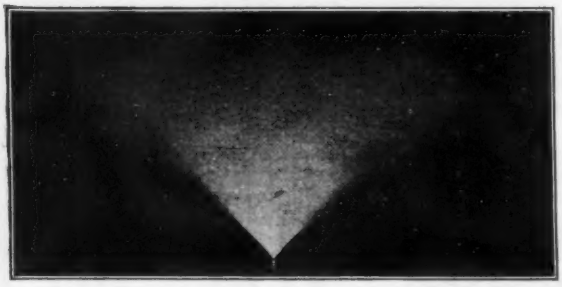


Complete Humidifying Plants

For Woolen Mills, Cotton Mills, Spinning Mills, Silk Mills, etc.

We also manufacture Injectors, Blowers, Condensers, Syphons, High Class Valves, Sulphur Furnaces for Bleaching Purposes.

CORRESPONDENCE SOLICITED.

This Lathe "Holds Out"

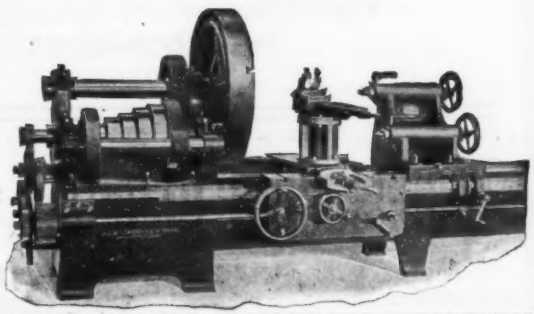
The wear and tear of 2 Lathes would put a "Double" Lathe out of business in short order if the best material weren't used. This means that absolute dependence can be placed on every "Double-spindle" sent out.

In other words—it's a "stayer." The parts that you don't see are the ones McCabe is over-particular about. The parts that you do see, you can judge for yourself.

We'll match either the 48 or 26 in. Swing 'gainst any Standard Lathe in the world—and "lest you forget," the price is half. That's "holding out" to you a pretty good Lathe opportunity, isn't it? 500 users find it trustworthy.

J. J. McCABE

14 Dey Street, - - - New York City



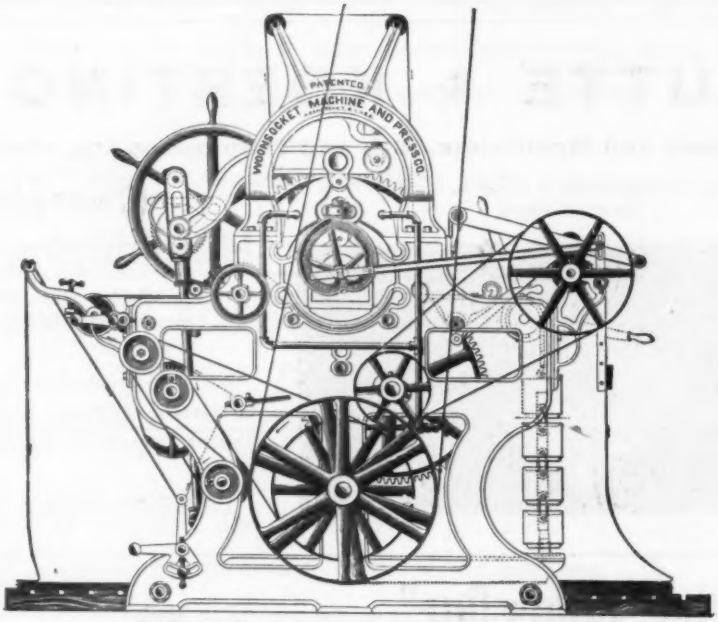
McCabe's "New Style" 26-48 inch "Double Spindle" Lathe.

Best Patent Steam Rotary Cloth Press

Four Separate Pressings In One Machine!

The Only Press that has Self-Yielding Beds with Four Points of Contact

PERFECT TEMPERATURE, POWERFUL, SIMPLE



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THE L. M. BOWES COMPANY,

Every Description of Fine Leather

FOR TEXTILE USE.

SOLE AGENTS IN THE UNITED STATES FOR

Charles Cain, Son & Greenwood,

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MAKERS OF HIGH GRADE

CARD CLOTHING

For Cotton, Woolen, Worsted and Silk.

451 Atlantic Avenue, - Boston, Mass.

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OF INTEREST TO TEXTILE MANUFACTURERS.

Textile Manufacturing Goes More Smoothly and Successfully in Certain Climates than in Others.

THE BELL SYSTEM

VENTILATION & HUMIDIFICATION
BELL PURE AIR AND COOLING CO.
TRADE MARK

Reproduces in the Mill any climatic conditions required. It automatically preserves throughout the year the best conditions of the best climates for textile working.

THE BELL MACHINE delivers air carrying moisture as aqueous vapor, just as it is found in nature, which moistens thoroughly and uniformly. Being SELF-REGULATING it does not keep on moistening when further moistening is useless.

Water delivered as a mist wets rather than moistens; settles on the surface in fine globules instead of being absorbed at once into the fibres. For further particulars address

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ANYTHING

Entire Outfits for New Mills, or small and odd items that that you don't know just where to obtain, can be found at the

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in Mill Supplies.

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—MANUFACTURERS OF—

Card Clothing of Every Description

FALL RIVER, MASS.

HAND Finished LOOM HARNESSES

ARE BEST

We finish our loom harnesses entirely by hand, for in no other way can the varnish and stock be so thoroughly worked into the twine and made a part of it. Hand work costs more than machine but our experience has shown that it makes a better harness.

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Formerly Loom Picker Co., Biddeford, Me.

SACO, MAINE.

E. L. TEBBETS & CO.,

Locke's Mills, Me.

Thread and Silk **SPOOLS** of any description made from one piece, up to 6" long and 3 dia.

We are located in the best white birch region. Our work and prices seem to satisfy the most particular customers. We can give any finish desired. Estimates furnished on samples submitted.

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Successors to The Bridesburg Mfg. Co.

In the Manufacturing of **SPINDLES,**

For Cotton, Woolen, Worsted, Silk and Flax Machinery. Manufacturers and Repairers. Also Flyers, Steel Caps, Bolsters, Steps, Tubes, Etc.

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Manfrs. of *BRAIDING MACHINES*

for making Dress Trimming Braids, Cotton Tapes, Underwear Braids, Shoe Laces, Spindle Banding, etc. Winders, Doublers, Measuring Machines, Reelers, Singeing and Finishing Machinery. Special Machinery.

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PERFECT RIGID CLOTH BOARD TRADE MARK

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Paper Cloth Boards

For Textile Mills

All weights and sizes furnished by thousand, ton or carload. Prompt delivery assured. Samples and prices on request.

The J. L. N. Smythe Co.

Leather Fibre S Manilla

23-25 So. 4th St., Phila.

Paper Specialties,

Fibres, Colored Textile Wrappers,

Manillas, and Tissues, Silk Papers, Corrugated Cloth Boards.

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DIXON LUBRICATING SADDLE CO., Bristol, R. I.

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Dixon's Patent Locking Saddles and Stirrups.

The weight can be taken off and put on to the middle rolls, without stopping your frames, when long staple cotton is used.

THE STIRRUP IS ALWAYS IN PLACE.
NO BENT STIRRUP RESTING ON ROLLS.

Manufacturers of all kinds of Saddles, Stirrups and Levers. Send for Samples and Prices.

Spinners' Supplies in general.

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Everything in Mill Supplies

"What you don't see, ask for"

Leather Belting	Heddles	Yarn Scales	Belt Hooks
Press'd Steel Pulleys	Heddle Frames	Roving Reels	Packings
Picker Sticks	Harnesses	Mill Crayons	Scales
Loom Pickers	Twine	Bobbins	Trucks
Loom Strapping (canvas & leather)	Spindle and Drum Banding	Spools	Brooms
Mill Baskets	Wire Goods	Shuttles	Brushes
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The Best That Money Can Buy

SPINNING RINGS.
TWISTER RINGS.
RING HOLDERS.
TRAVELER CUPS.
SILK RINGS.
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Correspondence Solicited.

WHITINSVILLE SPINNING RING CO.,

WHITINSVILLE, MASS., U. S. A.

STEEL AND BRASS

MAILS.

Liberal Discount to Dealers.

J. WALDER, Paterson, N. J.

REEDS, HARNESSES, LINGOES, SHUTTLES AND QUILLS.

FOR SALE.

Yorkshire Teasel Gigs and Slats

Write for particulars to

W. W. CRANE FOUNDRY AND MACHINE WORKS,
122-124 Clark St., Auburn, N. Y.

Reels for Cotton WOOLEN AND WORSTED

Patented Hosiery Winders, Cop Winders and Spoolers.

LINDSAY, HYDE & CO.,
2124 to 2130 East York St., PHILADELPHIA, PA.

SAVE
Their Cost
In Freight.

THE CHAFFEE PATENT CLOTH BOARD,
Made of paper and wood,
Needs no covers,
Will not split or warp;
Not liable to break.

MFG. BY
CHAFFEE BROTHERS COMPANY,
OXFORD, MASS.
BOX SHOOKS and CLOTH BOARDS.

Clean
LIGHT
Strong

Shaw's "Victor" Travelers

Manufactured by

VICTOR SHAW RING TRAVELER CO.

Incorporated 1899.

23 Sabin Street, PROVIDENCE, R. I.

SEVERIN HEUSCH, Aachen, Germany,

Specialist in the Manufacture of

Spirals and Ledger Blades for Shearing Machines

of all kinds. The oldest Cloth Shearing Knife Mfr. in Germany.
American Agents Wanted.

This Trade Mark on every package.

Look out for YELLOW Label.

There is only **ONE**

ALBANY GREASE

AND WE ARE THE ONLY MAKERS.

We have solved the problem of economical lubrication.

Cost of using oil

Cost of using Albany Grease

OUR SPECIAL OFFER, a Sample Can of Albany Grease with an Albany Grease Cup free of charge or expense for testing. The only information necessary to send is pipe connection in bearing, DEPTH OF OIL HOLE FROM TOP OF TAP TO JOURNAL, and give particular part of machinery on which the same is to be used.

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The LANE Patent Steel-Frame

CANVAS MILL BASKET

FIG.22.

Made of extra cotton duck. Frame of round spring steel and guaranteed against breakage. Rim bound with leather. Perfectly smooth inside. Light weight, strong and durable.

There are other special features in Lane Baskets to which is due their widely increasing popularity. Write for price list to

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MANUFACTURERS,

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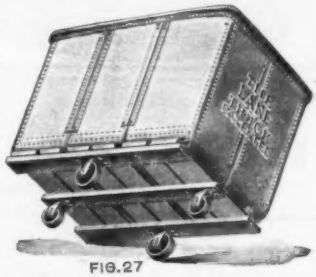
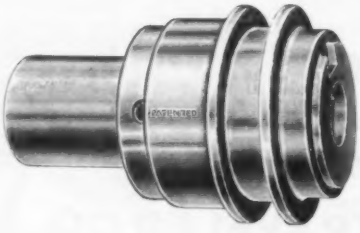


FIG.27

Sold by Leading Mill Supply Houses.

THE JOHNSON FRICTION CLUTCHES

SINGLE AND DOUBLE



For Machines, Countershafts, Lineshafts, Etc.

They are especially adapted for Textile Machinery. Very compact, powerful and neat, having a perfectly smooth surface eliminating the possibility of accidents. They can be instantly adjusted, as required, by one screw. Operate easily and work perfectly at any speed. They are being used by many of the leading manufacturers who endorse them in the highest terms.

Write for Catalogue.

THE CARLYLE JOHNSON MACHINE CO., - Hartford, Conn., U. S. A.

General Electric Company

INSTALLS

ELECTRIC POWER AND LIGHTING PLANTS

FOR ALL CLASSES OF

TEXTILE MILLS.

73,000 Horse Power in use or under contract.

THE ADVANTAGES OF ELECTRIC DRIVE ARE:

Saving in the cost of building, shafting and belting and of investment for future extension.

Increased production and fewer "seconds" due to absolute uniformity in speed.

More product per horse power at the engine.

Subdivision of power — independent operation of each department.

The General Electric Company employs specialists trained in textile work, whose services are at disposal of engineers or manufacturers for consultation or advice.

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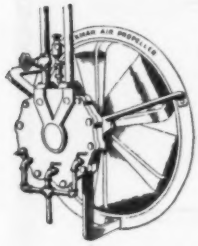
BOSTON OFFICE, 84 State Street.
ATLANTA OFFICE, Empire Building.

Sales Offices in all Large Cities.

Blackman Fans

With Direct Connected Engines.



ECONOMICAL FIRST COST OPERATION

Can be run at any speed and any time. No long shafting and belts to waste power.

For Dye Rooms, Factories, Boiler Rooms, or where there is moisture or dust they are the best apparatus ever installed.

E. M. NICHOLS,

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Smith, Drum & Co.

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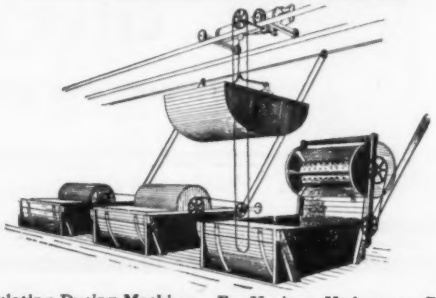
Dyeing Machinery

FOR WARPS AND PIECE GOODS

Bleaching Machines



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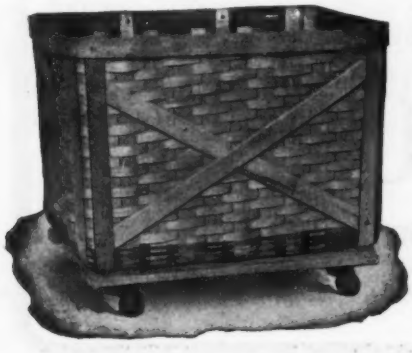

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MILL TRUCKS Extra Strapped Rattan or Ash.

Light, Stiff and Substantial. All sizes.

BASKETS all sizes and shapes for mill trade.

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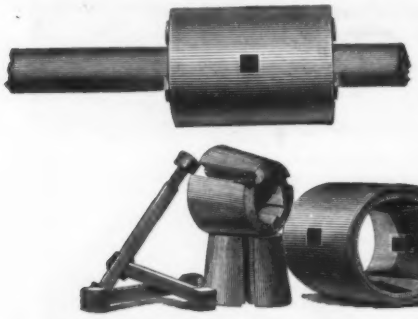
Send for Illustrated Catalogue "B" and prices.



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DOUBLE CONE VISE COUPLING

has a way of holding shafts together, that no other COUPLING can equal.

WILLIAM SELLERS & CO., INCORPD.

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Makers of

SHAFTS,
COUPLINGS,
PULLEYS,
HANGERS,

and all most approved appliances for the

Transmission of Power.

SEND FOR CATALOGUE AND PRICE LIST.

MACHINE TOOLS.
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Singeing Machines

FOR ALL KINDS AND WIDTHS OF GOODS.

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CORRESPONDENCE SOLICITED.

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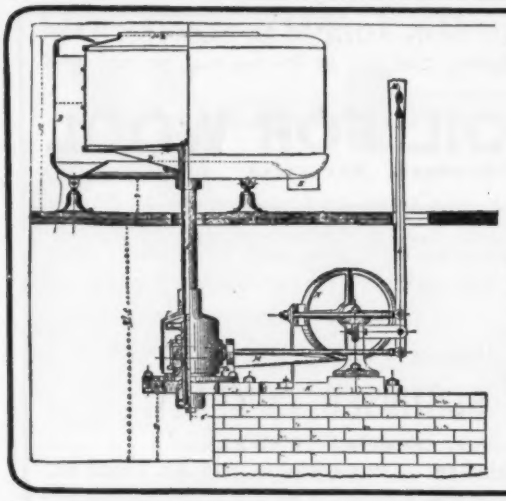
SALEM, MASS.

ELEVATORS

ESPECIALLY ADAPTED FOR MILL USE.

SEND FOR ILLUSTRATED CATALOGUE AND ESTIMATE.



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Special Machines for Acid Work.

SHAFTING, PULLEYS,
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American Tool and Machine Co.,

Incorporated 1864. Founded 1845.

109 Beach Street, Boston, Mass.

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ESTABLISHED 1841

COPPERSMITHS

STEAM JACKET KETTLES

Guaranteed to stand 150 lbs. cold-water test.

Equal, if not Superior, to any in the market

66 Pitts St.
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It Attracts Universal Attention Because it is THE BEST

BADGER'S
Fire Extinguisher

Has taken the lead in the United States, and is everywhere recognized for its efficiency. After competitive tests, lasting more than one week, THE UNITED STATES GOVERNMENT placed an order for 1,200 of

BADGER'S THE LATEST AND MOST APPROVED
Automatic, Chemical, Hand Fire Extinguisher Made

BADGER FIRE EXTINGUISHER CO.

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127 South 2d St., PHILADELPHIA, PA.

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New and Second-Hand

COTTON OR WOOLEN MACHINERY

of Every Description may be had at Low Prices from

GEO. L. SCHOFIELD, 123 No. Front Street,
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Send for List and state what you want.

AGENT FOR THE WESTON HYDRO EXTRACTOR.

By a process peculiarly our own, THE NON-SOLUBLE ELEMENT OF OLIVE OIL IS ELIMINATED, still keeping the oil at its normal gravity and body. This is

BRETON OIL FOR WOOL TRADE MARK

OLIVE OIL FOR WOOL

(Breton Brand)

which works better on Combs or Cards, spins as fine as the original, and when it gets to the washing and fulling, yields readily to the alkali or soap, and frees itself with much greater ease and facility than any other oil.

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TWO BIG FACTORIES.

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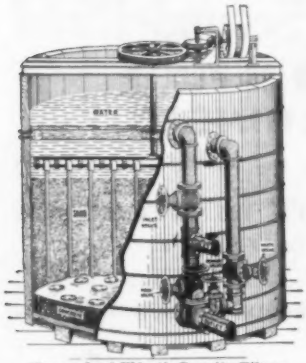

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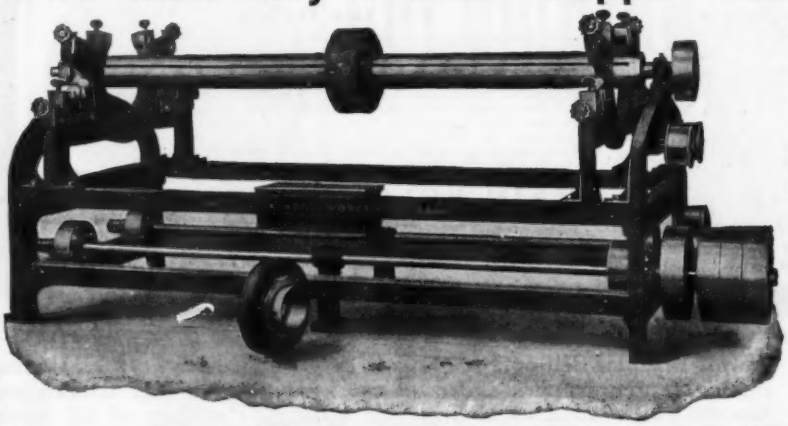

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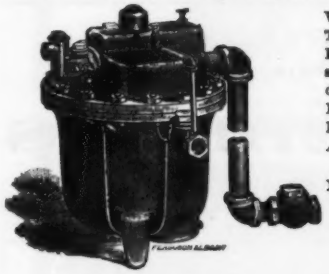

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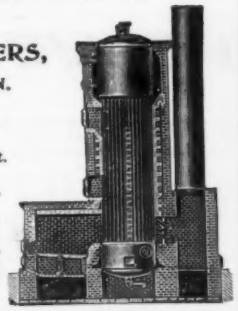

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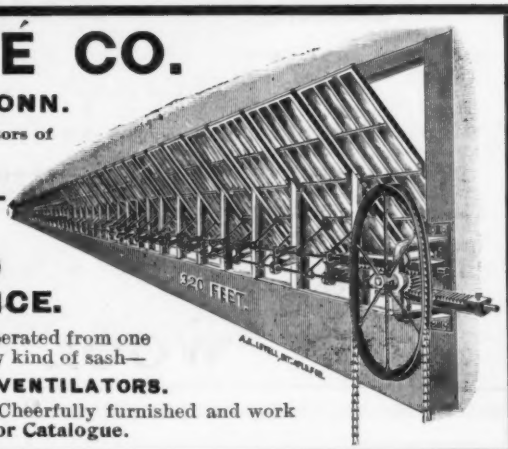

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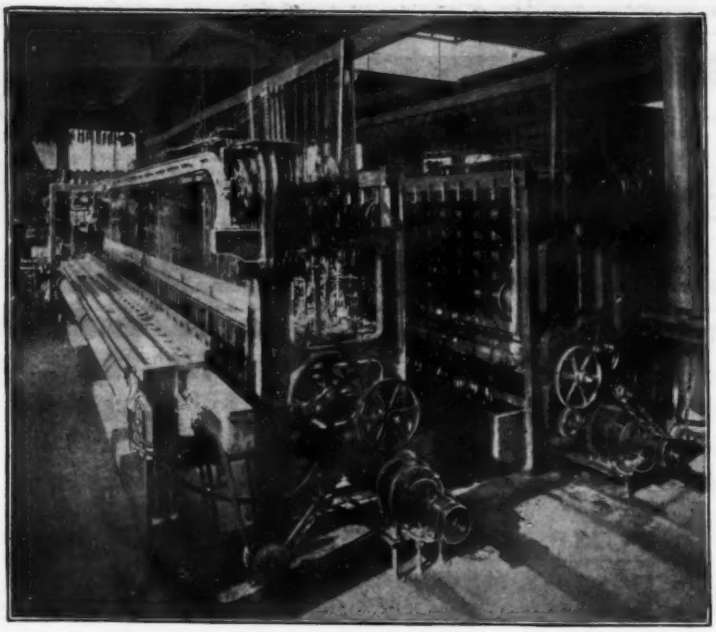

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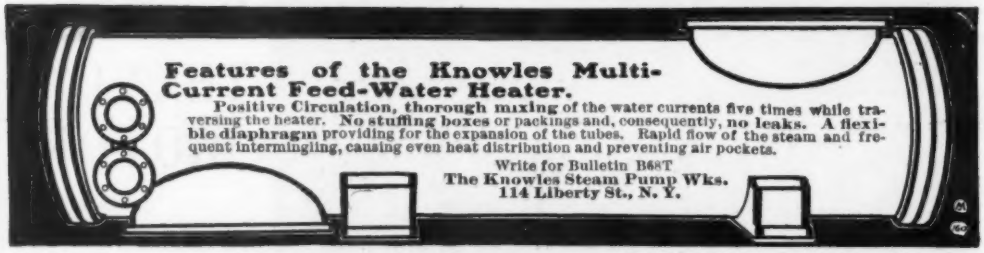

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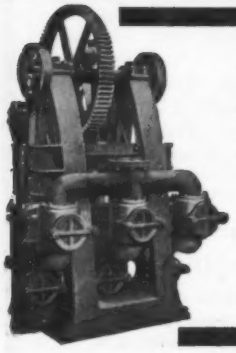

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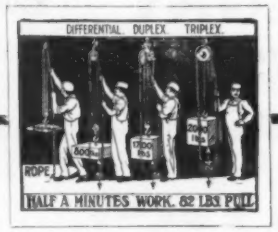

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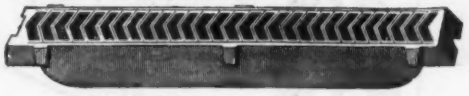

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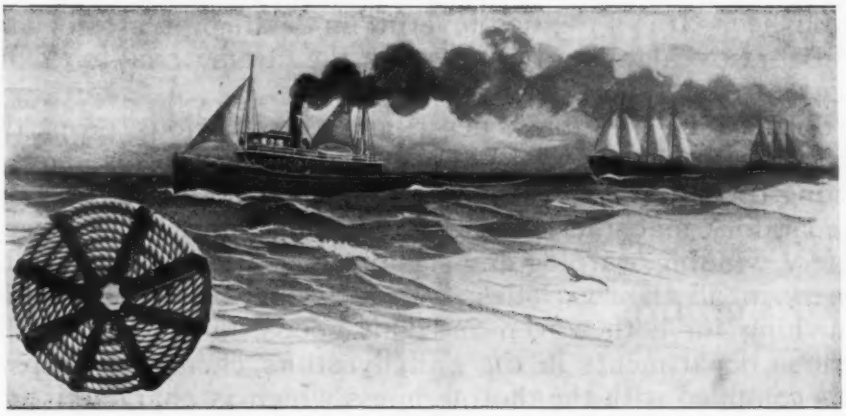

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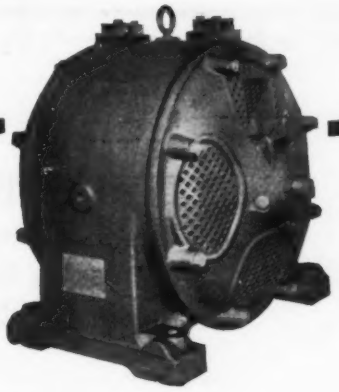

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Published Monthly by

LORD & NAGLE COMPANY,

FRANK L. NAGLE, President. HENRY G. LORD, Treasurer.

MAIN OFFICES:

299 Devonshire St., Cor. Summer St., Boston, Publication and Editorial Offices.

425 Walnut Street, Philadelphia.

BRANCH OFFICES:

123 Liberty St., New York. 115 Dearborn St., Chicago.

Entered at the Boston Post Office as Second-Class Mail Matter.

SAMUEL S. DALE, Editor. E. A. POSSELT, Editor Process Department.

Subscription and Directory Rates.

The **Textile World Record**, including **Annual Official Directory** (Traveler's Edition),	$3.00 per year
The **Textile World Record**, without the Directory,	2.00 per year
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PART I. Contains a complete directory of all the textile establishments in the United States and Canada. It tells what goods are made, the number of sets of cards, spindles, looms, whether and what they dye or finish, steam or water power, who the selling agents are, the names of the officers, superintendent and buyer.

There are 22 textile maps; gives population of town and railroad connections.

PART II. Is the Yarn Trade Index, containing classified lists of yarn spinners, arranged according to kind of yarn, size and number spun, etc. All the mills with worsted machinery are included in this section.

PART III. Contains classified list of mills doing order and commission work, also dyeing, finishing, bleaching and printing establishments, classified according to the kind of work done, and so far as possible giving width of goods handled; also shoddy, extract and flock manufacturers and wool scouring establishments.

PART IV. Manufacturer's Selling Agents and Dry Goods Commission Merchants, giving the name and address of concern, character of goods handled, different departments, with managers, list of manufacturing clothiers, and suit and cloak manufacturers, giving specialties and buyers names. A list of city offices of textile mills is given.

PART V. Dealers and Brokers in raw materials and stock, including wool and shoddy dealers and brokers, cotton dealers and brokers, factors and buyers and wholesale rag dealers making a specialty of textile interests.

PART VI. Buyers Index of Textile Machinery and Supplies, and statistics showing textile machinery in the United States, giving spindles, looms, knitting machines, etc.

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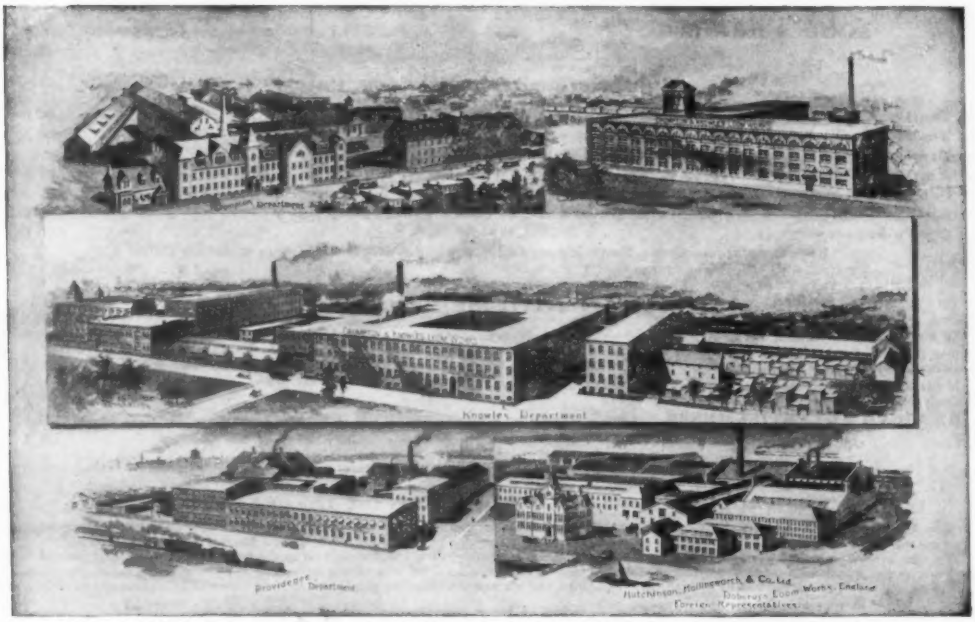

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Correspondence.

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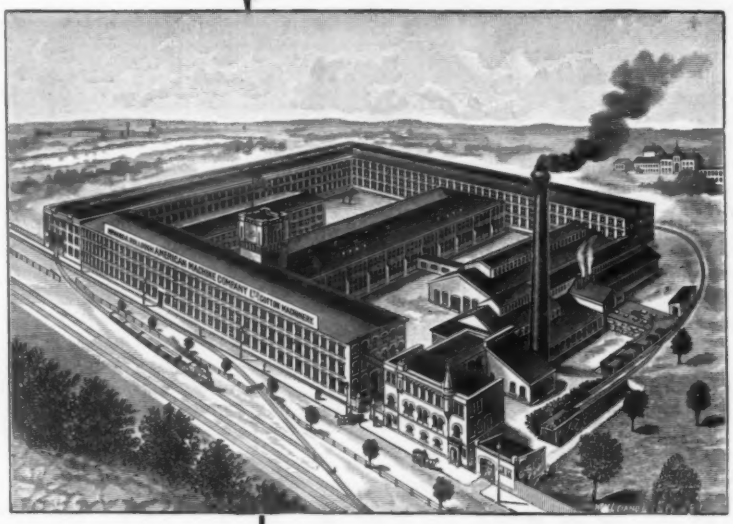

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VOL. 28. (NEW SERIES.) MARCH, 1905 No. 6.

Monthly Comment.

Value of Trade-Marks.

There is no doubt that a great many textile manufacturers are giving serious consideration to the possibility of selling their goods to the general consumer. Two years ago there were not more than fifteen or, perhaps, twenty advertisers of textile fabrics who used magazines or newspapers of general circulation to reach the consumer and sell their goods in that way, or to make their trade-marks known. In the last year, over fifty new textile advertisers have come into the field. Many more have the subject of advertising under serious consideration, and are only waiting to mature their plans and work out the practical details of how they shall do it, or to convince a still doubting member of their organization, often the man who holds the purse-strings.

Textile manufacturers have a rather difficult problem to preserve the identity of their goods when they enter into garments with many constituent parts, but various means have been suggested and successfully adopted, so today there is hardly a thing that goes into a garment or a suit of clothes or anything that is made of textile material but what the textile manufacturer can preserve the identity of his own goods.

Whether a manufacturer believes that the time has come for him to begin his advertising campaign or not, there is one thing it is time for, and that is to adopt some identifying mark, some trade-mark. He ought not to let a yard of goods go out of his mill unless it is marked in such a way that the consumer can know it by name, so she will know what to ask for a second time. That is something that ninety per cent. of the textile manufacturers have been neglecting, but it is the first step toward an advertising campaign. It is free advertising, and good advertising, if the goods are good. If they are poor stuff, better not mark them.

A striking illustration with direct application to present conditions was made by Mr. F. P. Shumway at a recent meeting of the Boston Boot and Shoe Club, in which he cites the case. Mr. Shumway said:

> May I give you an illustration of the value of a trade mark?
>
> Within the past few weeks there has been closed up one of the largest textile mills in Massachusetts, whose capital stock was over $1,000,000, who employed 2,000 people, and earned good dividends for more than fifty years. They have been doing business all these years through selling agents, who, I am told, have practically taken everything to satisfy their claim. They always made good fabrics, but, not having modernized their factory, or having acquainted the consuming public with the merits of their goods, they have today only a very large, poorly equipped factory plant and no orders, and no good will value to speak of. The closing up of this large corporation did not cause a ripple of excitement in the retail district, and the millions of consumers who have used their goods don't know yet, and never will know that they stopped,

because every jobber and retailer has simply substituted other goods. I doubt if ten gentlemen in this room, well informed as you are, could name this concern.

Now for a moment consider what would be the effect if any one of a dozen of the prominent named shoe manufacturers should become financially embarrassed. It would be talked about from Maine to California, and they would have in the very name of their shoe an asset which would be a very large factor in determining their future, because they have hundreds of thousands of satisfied customers who demand these named shoes at least twice every year.

There are many trade-marks and advertised brands which are worth thousands of dollars and belong wholly to the selling agent, jobber or middleman, and there are many manufacturers today making the goods for them to sell who have not a cent's worth of hold on that business, not even the name of their own goods. They may be turned down tomorrow by the owners of the trade-marks who may place their orders with some concern that will make them a little cheaper. Manufacturers, give your goods a trade-mark, or registered brand name and own it yourself!

British Exports of Textiles.

The total British foreign trade of 1904 amounted to more than four billion dollars, the imports being valued at $2,679,619,922, and the exports at $1,461,974,979. The excess of imports over exports was $1,217,644,943, which must be paid for in cash or charged against principal and interest of the debt due Great Britain from foreign countries. Textile products form 23 per cent. of the imports and 41 per cent. of the total exports, the figures being as follows: textile imports, $621,878,130; textile exports, $601,778,064.

The value of British textile exports in 1904 was over 80 per cent. of the total value of the textile goods produced in 1900 by all the mills in the United States, which amounted to $743,447,062.

A still more striking exhibit is made by the comparison of British and American exports of textiles. In 1904 the United States exported only $41,824,739 of manufactured textiles, or only one-fourteenth of the value of British textile exports during the same period.

Cotton Raising in Africa.

Of all attempts to raise cotton outside the United States, the most promising are those being made in Togo, German East Africa. The work of establishing cotton raising in that country is being directed and carried out with great energy and characteristic thoroughness, in spite of the many and serious difficulties encountered. The United States possesses the best land in the world for raising cotton, and of which vast tracts lie uncultivated because of a scarcity of labor to till the soil and pick the cotton. Transportation from the Southern States to Europe is rapid and cheap. European and American spinners are on the same footing in buying American cotton because under our Constitution there can be no tax levied on exports from the United States. Under such conditions the efforts to raise cotton in such a country as Togo, where nature has conspired to make the task difficult and dangerous, seems like a waste of energy. This view is strengthened by the latest reports of the operations in Togo.

The German Colonial Committee at its last sessions a few weeks ago issued an official report which stated that cotton cultivation in Togo and German East Africa is very promising. The decision of the government to build the Lome-Palime and Daressalam railroad has greatly encouraged those engaged in the establishing of the industry in Togo. The committee is formulating plans for establishing transportation routes by automobiles and carts to the railroads and rivers. The government has taken energetic measures to open roads and build bridges.

About 8,300 natives will be engaged during the present season in carrying cotton to the coast. The cost of transportation on the backs of natives is one mark per kilometer-ton and will amount to a total of 20,000 marks. The most serious feature in this connection is that the natives employed in carrying cotton on their backs to the coast are needed in the fields, as there is a great scarc-

ity of laborers. The extension of cotton cultivation this year has resulted in extraordinary demands upon the financial resources of the German committee. The funds obtained from the official lottery have been exhausted and further help from this source cannot be obtained until a new lottery is authorized.

The Togo cotton crop this year is estimated at 1,000 bales of 500 pounds each, the quality being equal to good American. The committee guarantees natives 7 1/4 cents for three pounds of unginned cotton, equal to one pound of ginned. Schools for instruction in cotton culture, experimental stations, ginning stations and markets have been established and given good results. A cotton exhibition was recently held under the auspices of the colonial governor. Experts have been appointed to study the pests which threaten damage to the cotton crop.

In German East Africa this season's crop exceeded the early estimates of 1,000 bales of 500 pounds each and the quality was equal to Egyptian. The committee guarantees to producers 9 1/2 cents per three pounds of unginned cotton, equal to one pound of ginned cotton. The colonial governor estimates next year's crop at twenty times the amount of this season's yield. Experts have been sent to Egypt to study the methods employed there. Eight thousand pounds of Egyptian seed have been required for this season's crop. It has not yet been decided whether native seed can be used for extending the cultivation. A small amount of native seed was sent to Hamburg to be tested for its oil. The price obtained was only $17.50 per ton because the seed was brown and the oil had a bitter flavor and was suitable only for certain limited uses. The usual price for seed is from $20 to $25 per ton.

Losses in German Mills.

Many manufacturers abroad, as well as in the United States, have recently suffered heavy losses because of the decline in the price of cotton, which reduced the value not only of their stock of raw material, but also of the stock in process and the manufactured goods. The exact proportions of the losses due to this cause will never be known, but that they must be most serious is shown by the recent report of the Gladbacher Spinnerei and Weberei Aktien-Gesellschaft in Germany In making up their accounts the year's profit of $75,000 was wiped out by the decrease in the value of the material on hand, due to the recent decline in cotton. It is estimated that the losses from the same cause in the Greiz-Gera district alone amount to more than $1,000,000.

Unpopular in England.

A protective tariff in America is exceedingly unpopular in Europe. An English textile journal expresses its aversion to the present United States tariff in the following terms:

> In loss of market we are sufferers from the antics which keep the American Tariff at its preposterous height. Were American woolen manufacturers more capable we should have to reckon with them in ways and in places where they are negligible now: but, at the same time, we should also have a chance of competing on fairer terms in the United States market. While solvency can consist with such transcendent incapacity, there is small prospect of any reciprocal reduction of the United States Tariff.

The reference to our incapacity, as woolen manufacturers, is based on a statement in an American journal that in a certain mill in the United States, according to a "know-it-all" salesman, fifteen sets of cards and half of the looms were idle, while the proprietor bought yarn and used silk noils that he had on hand. It is of course impossible to decide whether this particular Yankee manufacturer was incompetent without much more information as to the conditions in his mill than our English contemporary favors us with.

It is possible that incompetent manufacturers may be found in America as well as England, but that fact is no reason for changing the tariff policy of either country. The choice of protection or free trade must be made on broad considerations of the common welfare. If one thing has been settled by argument and experience during the past twenty years it is that a high protective tariff is essential to the welfare of American

people. Today two American countries, the United States and Canada, are following different policies in respect to the protection of the woolen industry. The United States under high protection imports woolens to the value of but 25 cents per capita of population and the woolen mills are prospering with the other industries of the country. Canada with a low ad valorem duty on woolens and a preferential tariff on British goods, is importing woolens to the value of $2.50 per capita, while the Canadian woolen mills are rapidly disappearing from the face of the earth, and the Canadian people are clothed in cheap and rotten British fabrics.

Wages North and South.

Direct comparisons between the wages rates of the North and South are misleading because of the difference in conditions prevailing in the two sections. These conditions must be taken into account in estimating the cost per yard that results from a given scale of wages. It is the general belief, probably well founded, that the chief and deciding advantage of Southern over Northern mills is the lower labor cost; but no reliable data to support this belief has been available to the public. The Massachusetts Bureau of Labor Statistics in its December bulletin gives some figures for Fall River and Southern mills which are of especial interest on account of the dearth of information on this question. The average weekly wages of cotton operatives in Fall River under the recent reduction of 12 1/2 per cent. are given as follows:

Mule spinners	$11.82½
Slashers, coarse yarn	9.32
Slashers, fine yarn	9.62
Weavers	7.44
Loom fixers	10.78½
Doffers, carding department	3.72
Drawing tenders	4.35
Lappers, strippers	6.15
Grinders, carding department	8.97
Speeder tenders	7.88
Picker room employees	5.47

The figures for the average weekly wages paid in Southern mills in 1903, taken from the report of the Pennsylvania Bureau of Statistics, are as follows:

Carding Room on 30's Yarn.

Overseers of carding	$24.00
Second hands	9.00
Grinders	7.50
Intermediate tenders and speeder tenders	5.40
Two-card strippers	5.10
Oilers, sweepers, roving tenders and slubber tenders	4.80
Jack frames	4.20
Railway head tenders	3.60

Spinning Room.

Overseers	$21.00
Section hands	7.50
Warping mill tenders	7.50
Roving hands	4.50
Banding hands	3.60
Oiling and shafting hands	3.60
Boy sweepers	2.40
Spinners (per side)	12½

Beaming Room.

Boss beamers	12.00
Beamers	9.00
Warp counters	6.00
Warp splitters	4.50
Drawers-in	3.60
Handers-in	2.40

Weaving Room (Not Including Weavers).

Boss weavers	18.00
Second hands	12.00
Loom fixers (50-loom section)	9.00
Folding machine tenders and brush machine tenders	6.00
Cloth inspectors	6.00
Filling carriers and cloth carriers	3.60
Water carriers and sweepers	3.00

Dye-house.

Boss dyers	30.00
Second hands	10.50
Ordinary help	6.00 to 9.00
Yarn men in yarn rooms	10.50

Sample Room.

Sample beamers	10.50
Sample loom weavers	6.00
Drawers-in	3.60
Handers-in	2.40

The Day After Pay Day.

Every mill man is familiar with the frequent failures to "show up" on the day after pay day. Those who are not victims of this habit have exhibited a surprising lack of charity toward the absentees, and an equally surprising skepticism regarding the variegated assortment of reasons advanced by the absentees when they finally "showed up." The temperance reformers have bluntly charged that drunkenness was the chief cause of the evil, which, they asserted, affected the

industries of the country in a large and increasing ratio.

Statements of this kind were repeated so often that the Massachusetts Bureau of Labor decided to subject the question to that final arbiter, statistics. Agents industriously canvassed 328 establishments in various parts of the Commonwealth and found that the absentees after pay day were nearly four times as numerous in February as in August. This was in direct conflict with the claim of the temperance reformers, who argued on a priori grounds that there was more loss of time among employees from the use of liquor in summer, when men can stay out of doors in comfort, than there was in winter. The results of the canvass show that out of 24,516 males over sixteen years of age, in 328 mills, one out of 25 was missing on the day after a certain pay day in February, and out of 23,312 males in the same establishments, one out of 96 did not show up on the day after a certain pay day in August.

The American Silk Industry.

The prosperity of the silk industry is indicated by the large quantity of raw silk being imported amounting in 1904 to 16,578,005 lbs., valued at $54,879,276, as compared with 11,655,333 lbs., valued at $43,135,197 in 1903. The quantity for 1904 is in excess of that for any previous year, and as all the raw silk consumed by our mills comes from foreign sources, the raw silk imports afford an excellent means by which to judge of the activity of American silk mills. Of the raw silk imported last year, nearly half by weight, or 48 per cent. came from Japan; 21 per cent. from China; 21 per cent. from Italy; 4 per cent. from France; and the balance, about 6 per cent., from other countries.

The question of producing raw silk in this country recently received increased attention because of the encouraging reference to it by President Roosevelt in his last message to Congress. President Congdon of the Silk Association of America referred to the subject at the last annual meeting of that organization as follows:

> You will remember President Roosevelt gave us one prognostication in his last message to Congress when he spoke of the possibility of our raising in this country our necessary supply of raw silk. Well now if we have ever had a President who comprehended the future better, was clearer in his judgment, more correct in his conclusions, more optimistic and "sanguinary," as Artemas Ward would say, than our sui generis President generally is, I don't think we can say which one of his predecessors it was. But at this time, on that subject, I think he might well pluck some feathers from the wings of his imagination and stick them in the tail of his judgment. The chunk of information that led him to this deduction is a gold brick of news to anyone familiar with sericulture. It is as chimerical a scheme as was the famous multicaulis craze which seventy years ago was going to make wealthy every one who could grow mulberry trees. It is incontrovertibly true that certain latitudes of our country are climatically favorable for the production of silk worm cocoons. As far north as Allentown we have raised worms successfully and woven some handsome silk goods from their cocoons. But the cost of the silk? Now we know that the reeling of silk from cocoons into skeins is done by hands who are willing to work for 10 cents to 15 cents per day in Italy in Japan for 8 cents to 12 cents, and in Cuba for even less money. It stands to reason, therefore, that to bring foreign raw silk to a parity with the American product an import duty would have to be imposed equal to the difference between American and foreign wages. This would be about $3.50 per pound, and then the cost of raw silk would be so great that all the silk mills in our country would have to close down and shut up, notwithstanding the duty might be 50 or even 75 per cent. on foreign manufactured silk fabrics. Silk cocoons are worth three and a half to four francs per kilo, say on an average of 35 cents per pound, and possibly our enterprising Southern friends could sell them profitably to foreign reelers, if their bulky freightage were not too expensive. But if all the women and children in the sections of our country adaptable to the production of cocoons were engaged in that industry, they couldn't begin to supply what is consumed in this country. It requires 300 worms to make a pound weight of cocoons. It takes about eleven pounds of cocoons to produce one pound of silk. That is about 3,300 worms per pound of silk. We imported in 1904 over 16 millions of pounds of silk. To produce this quantity it required the cocoons of some 52,800,000,000 worms. If the filament could be unwound from cocoons by machinery, American inventive genius would in some way compass and discover the means, but that never can be.

In addition to the raw silk we brought in last year from foreign countries $31,030,522 of silk goods, of which 44 per cent. came from France; 18 per cent. from Germany; 17 per cent. from Japan; 13 per cent. from Switzerland; 5 per cent. from Great Britain; and the balance, 3 per cent. from various countries. The total value $31,030,522, was $2,964,657 less than in 1903. This decrease

was shared by all the countries except Japan, which sold $1,938,985 more silk goods to us in 1904 than in 1903, this increase being equal to 56 per cent. of the imports from Japan in 1903.

The Care of Standards.

In our February issue we called attention to the exhibition of the national prototypes of measure at Buffalo and St. Louis, and of their transportation by express. This statement has been contradicted by the editor of the American Machinist. There is, however, no occasion for being astonished at his doctrine. Although he speaks as one having authority, he is only a scribe. We have an official statement from the Director of the National Bureau of Standards at Washington, that the set of standards on exhibition at St. Louis included the yard bar presented to the United States by Great Britain in 1855, and which was the last standard to be received from the British Government. We are also advised by the same Bureau that the meter bar received from France was not on exhibition at St. Louis, but was kept carefully guarded at Washington. This official information not only confirms our statement that the prototype standards were at St. Louis, but makes the case worse by showing the discrimination against the English standards and the prejudice in favor of metric standards on the part of the officials charged with their care at Washington. The contrast between the care of the meter and the neglect of the yard prototype shown by this incident illustrates perfectly the pro-metric and anti-English disposition of a large proportion of our officials. This disposition is not of recent growth, but has been slowly developed and seems to have become a fixed habit. As a result our yard standard is no longer compared with the original at London. A pretence of verification is made by comparing the yard with the meter. This is a pretence, because the yard is incommensurable with the decimal divisions of the meter; no lines on the latter can be found by which to verify the English yard.

It is a settled principle of our system of government that weights and measures shall be regulated by legislative authority. This right was wrested from the King in 1215 when the Magna Charta was signed with the clause "that there shall be one measure throughout all our kingdom." The Constitution of the United States provides "that Congress shall have power to fix the standard of weights and measures." By an order of Congress in 1836, "to the end that an uniform standard of weights and measures may be established throughout the United States," a set of standard weights and measures, similar to those in use in England anterior to the Act of Uniformity in 1834, was prepared by Hassler for each custom house and each State, and the United States courts, Mays v. Jennings, 4 Humph. (Tenn.) construed this as follows:

> Hence the old measures of England, superseded by the Imperial system, with such modifications as local customs or state laws have ingrafted upon it, may be regarded as the general standard adopted in this country.

In 1866 Congress passed a law making the use of the metric system permissive. For the construction of contracts and in legal proceedings the metric standards were then expressly defined in our customary English units, thus distinctly retaining the English system as fundamental. (For these purposes and these only a meter was to be 39.37 inches.)

In 1900 Congress ordered that:

> In diplomatic, consular and commercial reports all terms of measure, weight and money shall be reduced to and expressed in terms of measure, weight and coin of the United States, as well as in the foreign terms.

In accordance with this order metric expressions are reduced to English equivalents.

Moreover, it has been the uninterrupted policy of the United States Congress, which alone has the power to fix general standards of weight and measure, to keep the United States standards the same as those of Great Britain. In 1834 the British standards at London were destroyed by the burning of the Parliament Houses, and Congress soon after ordered, by a vote of both houses, that a complete set of the United States standards be prepared and presented to the British government. This was done and the standards, with one of the largest size balances,

were transmitted by our minister in London.

Likewise, realizing the importance of Anglo-American uniformity, the British Government in 1855 presented to the United States, through G. B. Airy, Astronomer Royal, copies of the new British standards of length and weight, among which was the yard bar which has recently been on exhibition at the St. Louis Exposition, transported by express. This 1855 yard was jealously guarded at Washington as a prototype until about 1890. In 1878 it was taken to London to be verified. The following is from an official account of its use as a standard after its return:

> The observations were made by Assistant O. H. Tittmann and Sub-Assistant H. W. Blair, simultaneously and according to this scheme, Tittmann on the right and Blair on the left, then Blair on the right and Tittmann on the left, bringing out the independent differences of micrometer readings by Tittmann and by Blair.

As soon as the metric standards reached Washington in 1890, a plot was apparently formed to make them the base for all comparisons, and thus obtain a pretext for the assertion that the United States had adopted the metric system. As the first step T. C. Mendenhall, a strong metricite, then Superintendent of Weights and Measures, issued an order, April 5, 1893, that the metric standards should be used as basic standards. Since that time the supporters of the metric system have claimed that our yard is derived from the meter. This statement has been industriously spread and grossly distorted in order to create the false impression at home and abroad that the weights and measures of the United States have been changed to the metric system and are no longer the same as those of Great Britain. Thus in a report by our National Bureau of Standards in 1902 to the British Consul at New York the following statement was made:

> In 1893, in accordance with the order of the Secretary of the Treasury, April 5, 1893, the metric prototype standards, the meter and the kilogram, were adopted as the fundamental standards from which the standard yard and pound were to be derived. . . . From the above you will see that this country has taken a long step towards the adoption of the metric system and so far as our fundamental standards are concerned we are today upon a metric basis.

Last year a metric bill was passed by the House of Lords after a brief consideration by a Select Committee, and is now pending before the House of Commons. The uniformity of British and American weights and measures is an insuperable objection to changing them by either the British Parliament or our own Congress. Let us see to what use the English metricites are putting the ridiculous claim that the American yard is derived from the meter. Recently the Electrical Engineer of London opened its columns to a discussion of the question by both sides, and Lord Belhaven, a member of the Select Committee above mentioned, and Vice-President of the Decimal Association of London, on December 23 thus expressed himself:

> Is it generally known that America has so far departed from the British system of weights and measures as to adopt the meter as the fundamental standard of length, the yard being derived from such standard meter?

This was followed on January 6 by a letter from E. Johnson, Secretary of the Decimal Association, in which he said:

> Within the last few years the United States have adopted a ton of 2,000 pounds, and have adopted a yard derived from the meter. This will show whether present-day business needs tend in the direction of decimalized weights and measures, in harmony with our universal scale of notation or not.

Upon being taken to task for this statement Mr. Johnson, on February 17, wrote as follows:

> With regard to my statement that in the United States the yard is derived from the meter and the pound from the kilogram, my authority is the director of the National Bureau of Standards at Washington.

It is no more possible to verify the yard by the decimal divisions of the incommensurable meter than to square the circle or accurately to measure 3 1/2 inches with a metric rule, and, as we have seen, Congress has never authorized the executive departments of the Government to adopt a yard different from that of Great Britain. The Mendenhall order was an arbitrary act of a government employee without the slightest Congressional sanction, and, as now construed by the metricites, a clearly unconstitutional usurpation of power. As we have just seen, it is being used in Great Britain to

persuade Parliament and the people that the United States has adopted the meter under the name of the yard, with decimal divisions.

The excuse assigned for discarding our prototype of the English yard as a standard, that the alloy is inferior to that of the 1890 meter, is not sound. Every metric standard ever made at Paris is open to well founded suspicion. The first one, the earth, was too large to be measured. The meter of the archives, an end standard, was rendered useless by wear. The new French standards of 1874 were condemned because the alloy contained impurities. New ones were then made, those of 1889, and based on the worn out meter of the archives. When the metric standards were distributed by lot in 1889, the 1874 bars of impure alloy were mixed with those of 1889, evidently on theory that one was no better than the other, and the United States drew some of both kinds. It will thus be recognized that the metric standards are not above suspicion.

Our National Bureau of Standards was organized as the custodian of our standards and its officials are clearly wrong in sending our prototype of the British yard around the country for exhibition purposes. It should be guarded carefully at Washington and regularly verified at London. If the alloy of which it is made can be improved, let a new and better bar be made. We are informed that the British Government is contemplating the construction of a set of new standards from the best alloy known. If that is done the United States should have duplicates to be regularly verified at London to the end that there shall be one measure throughout all English-speaking countries. There is no danger that any discrepancy will arise between the standards used in the real work of the two branches of the Anglo-Saxon race. If our pro-metric officials will not take the proper steps to care for and verify our standards, that work will be done by private enterprise.

In any event an end should be put to the present official discrimination against the working standards of the United States. Such unfair treatment is in strong contrast with the practice of the British government which guards the meter at London as jealously as the yard. This is indicated by the following extract from a letter of the British Standards Department, written recently to the Secretary of the British Weights and Measures Association, who applied for the information at our request:

> The Imperial Standard Yard is kept mounted on eight rollers, in a special steel case or safe in the strong room at this office. The Imperial Standard Pound is kept in a silver gilt box which is contained in another bronze box, the top of which is securely screwed down, and the whole placed in a special compartment of the steel case containing the yard.
>
> The prototype metric standards, the meter and the kilogram, are preserved equally carefully, and are kept in the strong room in this office.
>
> These standards are, of course, used as rarely as possible, and are never permitted to be removed from this office.

Attention is called to these facts with the hope that in future both the yard and the meter may receive at Washington what they get at London—a square deal and fair play.

Samuel S. Dale

MEETING OF THE AMERICAN COTTON MANUFACTURERS' ASSOCIATION.

An attractive program is being prepared by C. B. Bryant, secretary and treasurer of the American Cotton Manufacturers' Association for the meeting of that organization which is to be held at Knoxville, May 10 and 11. A large attendance is expected and a number of the members of the National Association of Manufacturers will attend this meeting and then go to Atlanta to attend the meeting of the last named organization on May 16. Mr. Bryant suggests that those who intend to be present at the Knoxville meeting should engage hotel accommodations in advance. A letter addressed to the Imperial Hotel, Knoxville, will receive attention. This suggestion is due to the fact that just at that time it is expected the hotels of Knoxville will be crowded to their utmost capacity.

The first cotton factory in the United States was built at Beverly in 1788.

Seasonable Fabrics.

MEN'S WEAR WOOLENS.

Most of the initial heavy weight business for the fall of 1905 has now been gathered in and the district has once more assumed its normal aspect of quietness and lethargy. There are still remaining a few buyers from near by points, but the activity so much in evidence a month ago has vanished; hence, this is a period of retrospection and review on the part of the seller and of revision and cancellation on the part of the buyer. Viewed as a whole, the volume of business transacted appears to have been fairly satisfactory—some of the mills being in

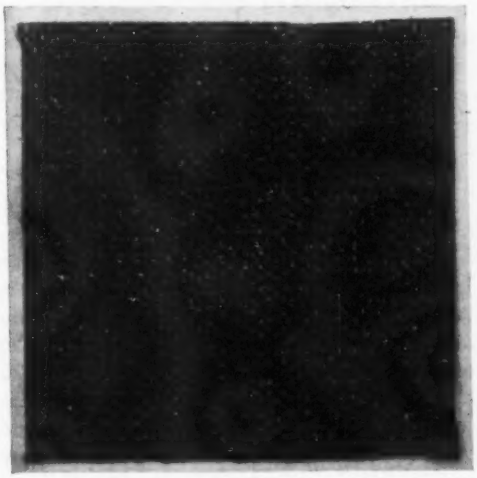


FIG. 1.

a very comfortable position, but with many others the reverse is apparent and unless duplicates will materialize to such an extent —that seems today improbable—their condition will prove anything but enviable. The radical advances on nearly all lines may be responsible for this state of affairs, and in addition there is the unwillingness of buyers to place orders for any more than is absolutely necessary to insure an early delivery. There is also a belief current among buyers that the present high level will not last and that the raw material market will be in an easier condition in the near future, due to the fact that large importations are now being received from Australia and New Zealand. The conditions can therefore be termed as both uncertain and unsatisfactory to buyer and seller alike. The fabrics that have received the greatest support are of the staple variety—such as fancy worsteds, similar to Fig. 1. This particular fabric is sold by H. & W. H. Lewis at $1.55, an advance of 12 1/2c. over last year. Goods of this character have been well sold up.

Mercerized worsteds from 77 1/2c. to $1.00 have been taken in large quantities. While the manipulation of this fabric has been carried to its uttermost limits and general disapproval is expressed by buyers on this account, still the orders are placed and an unusually large volume of yardage taken by certain who make a specialty of low priced garments. When fabrics have been deteriorated as these have been they cannot possibly be satisfactory to the consumer and the final result will be a revolt against goods of this character.

Overcoatings are fairly well supported and it is probable that the fancy variety will last another season, modified, however, both in colorings and design.

The American Woolen Co. announce an advance of 2 1/2 cents per yard on all Assabet suitings. The same company has opened its lines of Kerseys in Department 4. The more important ranges are as follows: No. 118 Medium $1.45, Light $1.55. No. 9,006 Dark shades $1.75. Assabet No. 235 Medium and Light $1.87 1/2.

Beaver Brook No. 1, $1.20. No. 945 Medium, $1.52 1/2, Light $1.60.

Burlington 0429, $1.37 1/2, Brown 0728, $1.95. Light $1.95 and 948 Brown $1.90.

Theordore Howard has opened Waterhouse and Buffum fancy worsteds at $1.40, $1.62 1/2, $1.75, $2.00, and $2.12 1/2. This line is both attractive and comprehensive.

W. J. Battery & Co., announce an advance of 10 cents per yard on all of Dunn's mercerized worsteds.

Adolph Schaus is showing the new lines of the Blankington Mfg. Co.'s fancy worsteds

with the quotations as follows: No. 200, $1.37 1/2; No. 500, $167 1/2; No. 400, $2.00; No. 1,000, $2.25; No. 600, $2.30; No. 700, $2.30; No. 800, $2.30; No. 950, $2.75; No. 1,100, $3.00; with a line of Overcoatings ranging in price from $1.67 1/2 to $3.00.

DRESS GOODS.

Manufacturers and importers of wool dress goods do not exhibit their collections as early as those of men's wear, but the business already booked is of the most encouraging nature; notwithstanding an advance of from 5 to 15 per cent. on all lines. Undoubt-

FIG. 2.

edly broadcloth will be the leader for fall. This fabric has been steadily gaining in favor for several seasons, until it is now looked upon as a reliable staple. The character of the cloth has been modified to conform with the present dress style necessitating soft finish, in place of the heavy compact weave that was in vogue for several years and instead of the heavy weight lighter finish is demanded; its desirability lies in the fact that it can be worn on varied occasions, both for street and evening, and is strictly correct for both purposes.

Henriettas, or the old fashioned cashmere, are forging to the front, and their use will be most general within a few months; an enormous quantity has been ordered out and the difficulty is to secure delivery; the buyers from all over the country are clamoring for their goods for the spring openings and in a large number of instances they will be disappointed unless their orders were in a number of months ago. Boesneck, Broesel & Co., who are considered one of the strongest houses for imported goods of this character, state that they cannot begin to fill the orders coming to hand.

A. D. Juliard, representing the Atlantic Mills, has received sufficient business on silk and wool cashmere to keep their looms running for months to come. The qualities that commend this fabric to the general trade are its sheen and lustre; it is light in weight and as pliable as chiffon. Bright colors in worsted mixtures are also commanding a full share of attention and initial orders on this class of dress goods are of more than average proportion, and while the major share of business is on staple lines and subdued colors, there are evidences of a growing demand for dress goods of pronounced color.

In addition to the demand for broadcloths and henriettas, panama voiles, imperial serges, prunellas, drap d' ete and vigognes are extensively bought for current wear. Light weight, hard twisted sheer fabrics in small checks and fine line overplaids embroidered, as shown in Fig. 2, are most desirable. This fabric is imported by F. L. Lovell (H. A. Caesar), 44 inches wide, at $1.10. The shepherd checks in black and white, and green and white, sold by Geo. Mesmin (Wm. Islin & Co.), 44 inches wide, at 75 cents, are most liberally used. These small checks and plaids, in sheer as well as heavy materials, are distinctly the mode this season; sometimes the surface is scattered over with dots and figures, and often there is a chine effect by the mingling of two shades in the weave.

Mohair has lost none of its popularity and is still taxing the energies of the importers who make a specialty of this fabric, and the domestic manufacturer is no whit behind. Some firms have as many as 10,000 pieces each on their books to be delivered between now and July 15, and one prominent maker remarked that he had enough to keep all his looms running until November.

SILKS.

The volume of silk produced in this country this season has never been equaled, and the demand for silk fabrics to be worn during the coming spring and summer is proving one of the heaviest in the trade's history. Manufacturers are in most instances sold ahead and the difficulty in securing deliveries is a continuous cause of trouble. This phenomenal demand is in a great measure due to the fact that shirt waist suits promise to be worn more extensively this summer than any season heretofore; this style garment commends itself to the feminine mind because of its dressy appearance and also for

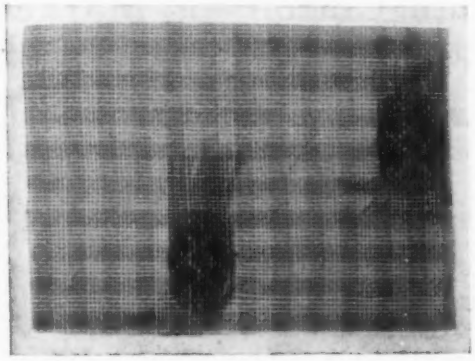


FIG. 3.

the reason that it is cool and comfortable during the heated period of the year, and the bulk of the business transacted on fancies is for small neat designs suitable for this purpose. The taffeta weave is in the lead, both in plain colors as well as fancies, but instead of the hard finish the request is centered on the chiffon and messaline order; suppleness and lustre being the essentials which mark the trend of the demand. The designs most favored are overlaid checks with a small jacquard effect. With the exclusive trade printed warps have met with strong support and patterns on the order of Fig. 3. This is shown by Cheney Brothers in a wide range of colors, 21 inches wide at 90c., and among the most prominent and successful. With the increased vogue for sheered dress material the necessity for silk linings is apparent and plain and glace taffetas are principally used for this purpose.

Jap silks are selling well and are much favored in embroidered Shantungs, as well as the staple plain Habutai.

WASH GOODS AND GINGHAMS.

Although purchases from first hands are now limited, there is an increased interest manifested in washable cotton dress goods by the retailers; the jobbers and converters, as well as the importers who cater to this trade report most favorably of the volume of business done during February. Many of the fabrics are of exquisite design and texture; silk and cotton mixtures on the nature of batiste in small and medium figures have proved most popular. Linen in the soft etamine weave, with an embroidered dot or figure, have also sold well. Among the most popular dress gingham may be mentioned the staple Toile de Nord in an endless variety of designs, some of which, as shown in Fig. 4, consisting of jacquard weaves, have proved exceptionally strong. This fabric is made by the Parkhill Mfg. Co., and sold by the jobbers at 9c. per yard.

Some numbers in Southern staple ging-

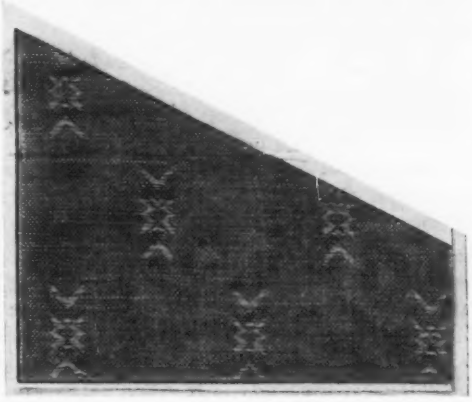


FIG. 4.

hams have been reduced in price. Cliff Side Standard, as sold by Cone Export Company, are now 3 3/4c. and the tendency appears to be towards a lower level on prints as well as low grade ginghams. The demand of buyers for lower prices on all classes of cotton goods has been persistent and in several instances concessions have been obtained.

WHITE GOODS.

The particular development which has been noted during the month has been toward fancy effects in light weight goods. The sheer fabrics have the call; embroidered Swiss mulls and batistes are bought in large quantities. There seems to be an over production in India linens, with the keenest kind of competition among several of the converters, hence concessions in prices have been secured, which proved very satisfactory to the buyers. On the whole, the condition is a healthy one and the tone of the market steady.

LININGS.

Business among the lining houses has materially improved and the volume transacted considerably larger than this time a year ago. Mercerized or lustrous finished goods furnish the bulk of the transactions, but percaline has also moved in considerable quantities. Prices have kept up remarkably well, in face of low priced raw material and a weak market. Edward's cambric, a standard cloth, has, however, been reduced to 3 3/8c. and concession of 1c. per yard has been obtained on the better grades of silesias and percalines.

Baling and Preparing Indian Cotton for Market.

[Two months ago the Textile World Record asked Mr. Skinner, the American Consul General at Marseilles, to investigate and report upon the methods of baling Indian cotton, the condition in which it is received at Marseilles, and to give any other information that might be of value to the American cotton trade. In reply we have received from him the following valuable report, which is evidently the result of a careful and intelligent investigation, for which he deserves great credit. The condition in which American cotton is offered for sale is a national disgrace, which has continued unabated in spite of the most strenuous protests from foreign and domestic cotton handlers and manufacturers.—ED.]

Marseilles, France, Feb. 7, 1905.

My American correspondents point out that there are defects in the present method of baling American cotton, and that an impression prevails in certain quarters in the United States that the methods of baling employed in India are much superior to our own. In reply to a request for a report upon this subject, I have to say that my correspondents' impressions in respect to the superiority of the Indian bale are fully confirmed by the Marseilles importers of cotton, who are familiar with every method of packing cotton known to commerce. While comparatively little cotton is received at this port, there is probably no place in the world where a greater variety is handled. The conviction is unanimous locally, that the Indian bale is far better from all points of view than any other.

The typical Indian cotton bale is of the following dimensions: length, 4.16 ft., height, 1.80 ft., width, 1.44 ft., weight, 396 lbs., tare, 6.60 lbs. This is equal to 36.7 lbs. per cubic foot. This is the old Bombay bale.

Within the last month, another form of the same weight has been received, the measurement being as follows: length, 3.08 ft., height, 2.42 ft., width, 1.27 ft. This is equal to 41.8 lbs. per cubic foot.

The cotton is covered with a light burlap and wrapped with twelve rounds of hoop iron. The hoop iron is in three pieces, each piece supplying three turns. The iron strap is not folded or riveted in any manner, the first round simply covering the first end, and the final end being slipped under the third turn. The pressure does the rest.

The Bombay bale is so convenient in size that one strong man can easily pick it up and stow it. One hundred Indian bales can be manipulated in as little time as fifty American bales, and with the same labor. The cotton is so compactly pressed, that a sharp blow from a hammer will cause the iron hoop to burst asunder, whereas the American bale binder must be pried open with a special tool.

The density of the bale minimizes the danger of fire. A foreman upon the docks, with whom I discussed this question, told me that a lighted match might be thrown upon an Indian bale, without much fear that the bale itself would be damaged, and that the working men who are in the habit of smoking a great deal, were under no special instructions

as regards sparks and matches, when handling Indian cotton. On the other hand, when American cotton arrived, the most minute precautions were necessary to prevent accidents. This same foreman told me, that some time ago, in lightering certain Bombay bales, a considerable number of them fell overboard into the port, and remained under water twenty-four hours. These bales were eventually recovered, and placed in the sun, each side being exposed twenty-four hours. The absorption had been so trifling, that the bales were dried completely in this time, and shipped to manufacturers in the north of France with other cotton, and without any claim whatever for allowances.

OPENING AN INDIAN BALE AT ONE BLOW.

The Bombay bale reaches the market in as good condition as when it left India. No cotton can be extracted, without breaking the metal hoop, and there is no loss therefore from theft or otherwise. The American bale is so loose that when exposed to rain or dropped in the mud, as may frequently occur, the cotton suffers considerably. French manufacturers consider that every American

THE LONG AND SHORT INDIAN COTTON BALES.

bale contains five per cent. of "crust," that is to say damaged cotton, from the exposed sides of the bale, which has to be scoured and specially prepared.

The most striking advantage of the Indian bale is its economy in space. The representative of one of the leading navigation lines doing business with India writes to me as follows:

"We bring large quantities of cotton from Bombay for Barcelona, via Marseille; very little cotton remains in this city. We carry it on the basis of 50 cubic feet per ton. Here is a very fair example of how it weighs and measures, and this is taken as a fair average: Each bale of cotton weighs from 396 to 405 lbs. Fifty bales weigh 20,400 lbs. and measure 13.6809 tons. This is for very hard

hydraulic-pressed cotton. I should think it would be difficult to improve upon the pressing as now done in India." I learn, however, that the more common custom is to figure Bombay and Kurrachee cotton at the rate of 40 cubic feet per ton, a notable economy in space.

I am unable to obtain in Marseille the measurement rate of American cotton, but it is reasonable to suppose that if our exporters would reduce by fifty per cent. the present loose bulk offered for export, they would be entitled to a very important reduction in rates. The present American bale weighs 500 lbs. and the tare averages from 26 to 31 lbs.

The intense pressure to which Indian cotton is subjected does not appear to affect the quality of the fibre in any manner. The bale itself is so hard, that it rings under a blow like a block of wood. My informants are so convinced of the immense superiority of the Indian bale, as to believe that it would have been adopted long since in the United States if the American fibre could successfully withstand the same treatment. One importer seemed to think that the drier quality of cotton received from India might warrant the high pressure applied, submitting the idea that the more humid American cotton would deteriorate, unless lightly packed. It does not appear, however, that the difference in humidity is very great, as Bombay cotton under a 100 (C) test shows from six to seven per cent. of humidity, American cotton seven and one-half to nine per cent., Chinese cotton nine to twelve per cent. The more likely explanation is this: Indian cotton is exported by a very few large firms located at Bombay and Kurrachee, who receive from the natives the freshly picked cotton, lightly packed in bags. They are in a position to concentrate the business, to erect expensive hydraulic presses, and apply the most modern methods in their warehouses. American cotton, on the other hand, is grown throughout the South, and packed in much smaller quantities by actual growers, who are naturally unable to afford a heavy investment in power presses, contenting themselves with simpler methods.

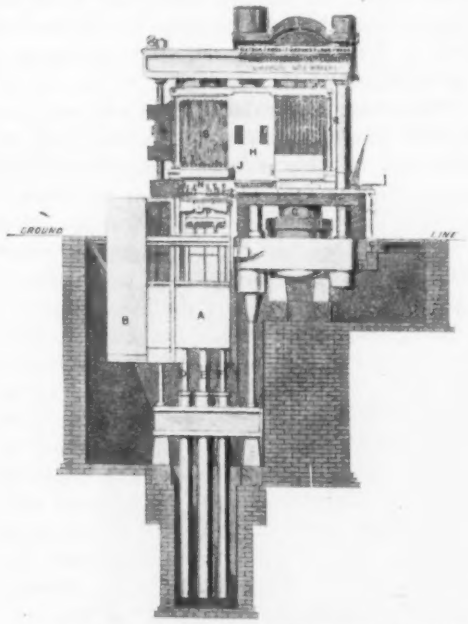
DRAWING SAMPLES FROM INDIAN COTTON BALES.

The Shanghai cotton bale weighs from 550 to 572 lbs., and is as dense as the Indian bale. The Kurrachee bale weighs 440 to 484 lbs., but is otherwise like the Bombay bale.

My conclusion is, that if there is no insuperable obstacle to the adoption of the Indian bale, it might be very profitably substi-

tuted for the present unwieldy American package. I have obtained photographs taken upon the Marseille docks, showing both the old and the new form of Bombay bale.

I am informed that the following British firms supply Indian exporters with pressers



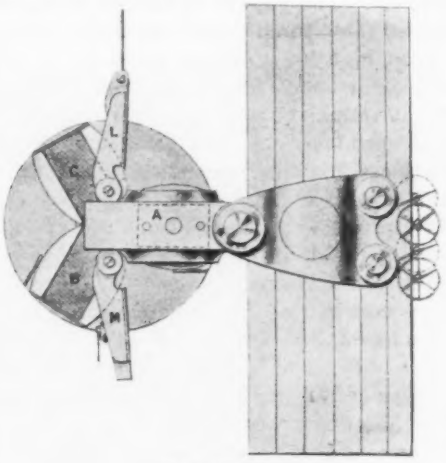
FRONT ELEVATION OF THE WATSON-FAWCETT PRESS.

which produce the typical Indian bale: John Shaw & Sons, Wellington Street, Salford, Robert Middleton, Sheepscar Foundry, Leeds, Henry Berry & Co., Ltd., Leeds, Fielding & Platt, Ltd., Gloucester, Fawcett, Preston & Co., York Street, Liverpool.

Since writing the foregoing, I am in receipt of a letter from Messrs. Fawcett, Preston & Co., of Liverpool, as follows:

"We have made may presses for India and China, which turn out 50 to 60 bales of cotton per hour of 500 lbs. each, and measuring under 10 cubic feet. Such bales are non-inflammable, and do not require "screwing" into the hold of the vessel, as it is customary with the bales compressed in the cotton ports in the States. No instance of a cotton fire on board ship or in warehouse has been known with these Indian-pressed bales; whereas fires are of constant occurrence with American bales, owing entirely to the difference of the systems used in preparing and pressing the bales, and in spite of the fact that the large compresses in the United States exert fifty per cent. more pressure on each package than the Indian pressers do."

Our illustrations show the Watson-Fawcett press used for Indian cotton. This press is adapted for dealing with bales of from 400 to 600 lbs. weight. In a report to the owners, in India, on the work done by it, it is



PLAN OF PRESS.

stated:—"The last few days we have been pressing 300 to 311 bales of 460 lbs. per day of 11 1/2 hours. We fully anticipate that as we get into milder weather, and especially when it becomes damper, the above out-turn may even be exceeded.

The regular out-turn may be taken as equivalent to about 25 bales of cotton per hour of 500 lbs. weight, and 9 1/2 cubic feet measurement each bale.

This press is fitted with three lower preparing boxes which revolve, and with a two-ended upper revolving chamber.

ROBERT P. SKINNER,
American Consul General at Marseilles.

In 1148, Roger I, King of Sicily, having taken the cities of Corinth, Thebes and Athens, took from them a great number of silk weavers and forced them to live at Palermo and carry on their trade there.

STATUS OF THE AMERICAN FLAX FIBRE INDUSTRY.

BY CHAS. RICHARDS DODGE.

In spite of the fact that it has been fully demonstrated, by carefully conducted experiments, official and otherwise, that we can grow flax for fiber in the United States, and that a great deal of literature has been published and disseminated regarding the industry and its needs, it can scarcely be said that we have even the beginning of a commercial industry. The growth of flax for seed, to be sold to the oil mills, has long been practiced, and as high as a million acres of such flax have been under cultivation in a single year. But it should be remembered that the flax straw produced by this form of culture is worthless for fiber purposes, and that the greater portion of it can only be burned as a waste product to get it out of the way. Even as a material for paper stock it has little value, as the return in fibrous matter is too small, considering the cost of reducing it, to make its employment a profitable industry.

The difference between culture for seed and flax culture for fiber, is the difference, in result, between sowing two pecks of seed to the acre on simply prepared new land in the first instance, and 1 1/2 to 2 1/2 bushels per acre on a most carefully prepared and suitable soil, and according to an intelligently established practice, in the second instance. In one case the result is a coarse, spreading bush with woody stems, and top branches covered with seed, and in the other a straight, smooth, slender stem, branchless, but rich in fiber, and yielding readily to treatment in the process known as retting.

In an extended experiment conducted by the writer some years ago, in the Puget Sound region of the Pacific coast, flax straw was secured, which, when afterwards retted and cleaned by the Barbour Company of Lisburne, Ireland, yielded grades of fiber—according to treatment—worth from $200 to $500 per ton. The latter price representing a superior quality of extra hackled flax. Good flax has been produced in other sections of the country, and in the region of Yale, Michigan and in Canadian territory contiguous, a good commercial flax has been produced by a well known concern for years. A little flax is grown in Minnesota, and something is being done in Oregon, though not with any large degree of success.

Our illustration shows a field of flax straw, pulled and curing in shocks, grown by Eugene Bosse, at Salem, Oregon. I am indebted for the photograph to Lyster H. Dewey, fibre plant botanist, Department of Agriculture.

There are several reasons why a commercial flax fiber industry has not been established in this country on a profitable basis. In the first place the manufacturers, who are the purchasers of flax, cannot afford to ignore a reliable source of supply, where the fiber is of known quality (as grown on foreign flax fields), for a doubtful supply of home grown fiber of varying quality, some of which they could not afford to purchase at any price. Contracts must be made in advance, and certainly there must be a visible supply, and in quantities to satisfy their demand. This presupposes that the American supply, if obtainable, must be derived from farmers, who, naturally, at the outset of establishing the new industry, would not only be unskilled in the production of standard grades of commercial fiber, but the flax from twenty independent farms might show twenty different grades, or kinds of fiber.

The inability of the American farmer of the present age to carry on all of the operations of the flax fiber industry has been proved by government and other investigations, and the fact has been established that the American flax fiber industry, to be commercially successful, must be conducted something as the creameries are conducted at the present time—that is to say, with three divisions of labor.

The farmer should grow the crop of "straw" under the intelligent direction—let us suppose—of a "factor" or middle-man who purchases the crops of the farmers of an entire district, seeing that the straw is harvested at the proper time, the retting and the scutching being attended to at a central factory or mill, and all under the direction and management of one person—let us say, the superintendent of the central factory. By this means

a uniform product will be secured—though necessarily there would be several grades of flax—though farmers will be relieved from the labor of retting and especially scutching, which would require special capital, and which are not, in any sense, farm operations; and lastly the farmer will be saved from the trouble of finding the best market. The managers of the central mills or factories would be in touch with the manufacturers or flax buyers, and would be able to know, approximately, very early in the season what quantities of flax fiber the market could depend upon, knowing the total acreage under cultivation in the particular districts, and would be in position to quote prices on carload lots, while the manufacturer would be assured of a home supply.

A FIELD OF FLAX STRAW AT SALEM, OREGON.

Conducted on these lines a flax fiber industry is possible in this country provided the high wages for farm labor can be sufficiently overcome to admit of competition with European flax growers.

The difference in wages between this country and Europe, in relation to this industry, are, to a certain extent, equalized, as American farm laborers not only have the knack of doing things more quickly, but employ labor saving machinery in all the operations of soil preparation and cultivation, which is not the practice of the small flax farmers of Europe. Think of an American farmer "rolling" a ten-acre tract of flax land by tramping up and down with boards strapped to his feet! Weeding the young plants, and especially "pulling" the straw at harvest, will always prove obstacles to the success of the industry on American farms. The straw must be pulled up by the roots, not cut, and it is a laborious and costly operation. Our farmers will never take kindly to it, and even a foreigner who has pulled flax in Europe will not bend his back to such work in "blessed America" when there are so many crops, other than flax, that will yield an assured profit without such fatiguing labor. Inventive genius has endeavored to solve the difficulty by perfecting the machine puller, but while a number of such inventions have been built and tested, not one has fulfilled the requirements of a practical machine.

The retting of flax is a difficult operation not only demanding a nice appreciation of all the conditions requisite for success, but requiring time, skill, and the exercise of judgment. Properly retted flax fiber, whether secured by dew retting (by spreading over a meadow) or by water retting (immersing or

steeping in pools, or in streams of running water) always possess certain readily recognizable characteristics, which an expert is able to appreciate upon handling the fiber, and even with his eyes closed. The old European flaxmen call this the "nature feel." It is "live" fiber, soft and smooth to the touch and lustrous to the eye, with a peculiar odor that is unmistakable. And a flax fiber that has not acquired this "natural feel," and has not the right smell, is not a flax that any thread or linen manufacturer will care to buy, though it may be adapted to some uses, such as certain kinds of cordage.

The trouble with all of the so-called quick-retting processes, whether they involve the use of chemicals, steam, or other means than the old fashioned retting methods, has been that the fiber is "lifeless;" it is harsh and dry; lacks softness, though it may show lustre, and whiteness. The writer has handled the flax produced by many of these quick retting processes, both in this country and Europe, but none of them had the "nature feel" or the familiar smell of first class fiber. It is true that some examples were soft to the touch, so very soft indeed from over treatment that such fiber would not hold together on the spindles, while being spun into a yarn, but fill the air with clouds of dust from its disintegrated particles.

Good examples of a very recent quick retting process, that I have been able to examine, give no promise that commercial success has been reached. It was not the fiber to please an old Irish or Scotch flax handler. There is a European process, however, a water retting system, which shortens the time of retting, but even this process has not proved a pronounced success in the United States, though I have seen good flax produced by it abroad. Mr. Loppens, the inventor, brought it to this country some years ago with the idea of establishing a flax fiber industry on the Pacific coast, but his efforts have been abandoned.

One word about saving the seed when flax is grown for fiber. It has been said over and over again by the opponents of flax culture in this country—and books have been written upon the subject, in the interest of certain importers—that when flax is grown for fiber the seed must be sacrificed, and the farmer lose a portion of his profit. I will only say that experiments in this country wholly disprove such statements. In Europe the seed is saved with the fiber, and both seed and fiber can be saved here, although good judgment must be exercised regarding the proper time to pull the straw.

The flax used in this country comes from Russia, Holland, Belgium and Ireland, though much of the so-called "Irish flax" is Belgian flax prepared in Ireland. Germany and Austria both produce flax, though they are purchasers, as a rule, and have none to export. Canada produces some very good flax, and I have seen a fair quality of fiber in Mexico, where there are mills for its manufacture into coarse fabrics. We import flax to the value of about two millions of dollars, besides large quantities of flax manufactures. The only linen produced in this country is a coarse crash, and not much of that.

THE OPERATIVE VALUE OF SPINDLES.

BY OVERSEER.

The operative value of spindles is not a difficult problem to solve, yet the frequency with which spindles are stopped here and there on slubbers, speeders, spinning frames and mules leads to the conclusion that there are scores of people who do not realize the full value of a productive spindle. Of course the productive value of spindles has a wide range of variation. It varies with the quality and number of the yarn spun, the speed and style of the spindles, the supervising facilities, and finally with the margin of profit at which the product is sold.

Spindles are only means to an end. They convert roving into yarn in just the proportion they are kept operative. Idle spindles are worse than non-production, for they bring about a two-fold loss, a loss from retarded production upon which a profit cannot be made, also a corresponding loss in the increased cost of production obtained from the remaining productive spindles.

To illustrate this, take a plant of 10,000 spindles which, when fully operative, produce

10,000 pounds of yarn; let us assume that for several reasons 200 spindles are idle all the week. The loss of production will be 200 pounds of yarn. If the product of this mill is sold at a profit of two cents a pound, the unearned profit would be (200 × .02) $4.00. If the pay roll of the spinning department is $200 per week when all the spindles are running the cost per pound for spinning will be ($200 ÷ 10,000) 2 cents, but if there are 200 non-producing spindles the production will be only 9,800 pounds. The pay roll being the same, the cost of this production is increased to ($200 ÷ 9,800) 2.04 cents per pound, making an additional loss of .04 cents per pound, or about $4, which when added to the other $4 mentioned as profit which would have been earned, makes a total difference of $8.00.

The mill, with all the spindles running, could have earned $8.00 more profit than when 200 spindles were idle and the help paid to keep them running. Carrying this rate along for a year we have (52 × $8) $416, a total deficiency of about $2 per idle spindle for the year.

Another illustration: If a plant of 10,000 spindles has a capital stock of $200,000 and the average production per spindle is one pound per week, with the product selling at a profit of 2 cents per pound, the plant will have a profit of about 5 per cent. on its capital, and the true operative value or earning power per spindle will be $1 for the year. But if for any reason 200 spindles fail to produce anything for the year there will be 4 per cent. less profit, or 1/5 of 1 per cent. less profit on the entire capital stock.

In view of these facts it is clear that idle spindles are not wanted in any mill. The profit of the plant must be derived from the product of the spindles. Idle spindles on spinning frames for which help are being paid to keep operative are not like spindles which are not in the mill, because nothing is paid out to keep spindles idle that are not owned by the company.

There are numerous causes for idle spindles such as broken bands, dry bolsters, waiting to be doffed, breakages in machines and plant, waiting for any kind of supplies, such as bands, roving, rolls, stirrups, guides, oil, bobbins, belting, rings, travelers, waiting for power, stopped to be oiled, back ends neglected by spinners, etc. To show how fast this counts up, take a day's record for an example: Total running time for 10,000 spindles for one day is ten hours. Suppose that one spinning frame of 200 spindles is stopped two hours for a broken gear because the gear had to be made before the frame could be started. This is equivalent to having 40 spindles stopped ten hours. Owing to the inefficient band boy there were on an average 25 spindles stopped for ten hours. The doffers were too slow and caused two frames of 200 spindles each to be stopped 2 hours or 80 for ten hours. Unattended back ends stopped 10 spindles all day. Spinners stopped frames needlessly, which equaled 50 spindles stopped ten hours, making a total of 200 spindles stopped all day. If this is repeated every day the results at the end of a week are as already outlined.

The remedy for preventing this loss is to impress upon the help the value of keeping all the spindles on an earning basis. Keep the frames doffed, never have two frames stopped to be doffed at one time. Have plenty of supplies on hand. Keep the bands tied on. The spindle is the life of the plant.

THE COLORS OF ORIENTAL RUGS.

Why are the colors of oriental rugs dyed with vegetable dyes by the primitive methods of eastern countries, faster than when dyed with the artificial dyes? That they are faster to light and washing is generally conceded in the trade and by the governing authorities in many rug manufacturing sections of Asia and Northern Africa, where in some cases the use of artificial dyes is officially prohibited as calculated to work serious injury to the reputation and sale of the goods bearing the name of the district. Last year the Governor-General of Algeria sent the following letter on this subject to the prefects of his departments:

My letter dated July 5, 1903, advised you of the subventions accorded to native trade schools and recommended that the directors of these schools apply themselves to the study of the Arabian rug industry, with a view of coloring the wool with vegetable dyes to the exclusion of aniline colors.

My office is occupied in compiling a manual which will give all useful directions regarding the preparation, and spinning and particularly the coloring of the material. This manual will be placed at the disposal of school directors and all persons who are engaged in the manufacture of rugs. I desire that the prefects inform themselves regarding the nature and properties of tinctorial plants which are found in their respective districts in order that they may be in a position to advise intelligently the natives in the douars who are engaged in the manufacture of rugs, blankets, and other fabrics made of wool.

Each prefect should impress upon these workers that it is to their interest to use vegetable dyes only for coloring the wool; that by this means they are able to enhance the commercial value of their products and be able to sell them more readily, as the public appreciate not only the beauty but also the durability of the design. I am disposed to give substantial encouragement to those natives who show that they are following these directions faithfully. Prizes will be given to those natives producing goods colored with vegetable dyes. The awards will be made after examination of the goods by the director of the school of Beaux-Arts at Alger. We will likewise assist those who have made tests of the culture of tinctorial plants. I request that you give the administrator of your department full instructions in regard to this subject and see that they are strictly obeyed. Jonnart, Governor-General.

If, as chemists generally claim, the artificial and vegetable dyes are in every respect the same, the difference in the colors derived from them must be due to the difference in manipulation. This theory, however, involves the improbable supposition that the Oriental rug dyers use different processes for applying the natural and the artificial dyes. If they do not, then we are forced to the conclusion that between the natural and artificial colors there is a difference that chemical analysis has not detected or that chemists have not revealed.

The question opens up a field for important research. Recognizing this fact the Algerian government has formed a plan to collect and publish the information now in the possession of the native dyers, often regarded as secrets of the trade, concerning the best methods of using the natural dyes. Prizes are to be awarded for the best paper submitted before May 1, 1905. The details of the competition are stated in an official circular, of which the following is a copy:

In order to encourage and facilitate the manufacture of Algerian rugs and the use of vegetable dyes to the exclusion of aniline colors, the general government has adopted a competitive plan for compiling a practical manual of dyeing for Algerian trade schools. This manual will contain all the useful information on the points hereinafter mentioned, and will be devoted to practical directions to the exclusion of theory

1. Various qualities of wool. Average price of each grade. Scouring and rinsing of wool. Tools, implements and materials necessary. Bleaching, mordanting. Spinning processes. Warp and filling yarn.

2. Dyeing. Colors, excluding aniline dyes. Tinctorial plants, and places of origin in Algeria. Scientific and common names. Selling prices. Directions for obtaining dyes from each plant. Details of manual operations for both hot and cold processes. Methods for producing the clearest and deepest shades and for obtaining shades by a combination of two or more colors. Average price of the materials used. Proportions of dyes and chemicals as related to the volume of water and the weight of the wool. In general, all the processes of dyeing in their simplest details from the mordanting to the final rinsing of the dyed wool. One or two plates of designs and a scale of colors will be added to facilitate the determination of tinctorial plants and indicate the corresponding colors.

3. Brief data regarding the machinery and tools to be used and the best processes for preparing, scouring, spinning, dyeing, and weaving the material.

4. Description of the genuine Algerian, Moorish, and Tunisian carpets, their distinctive characteristics, varieties and methods of manufacturing, also their market value.

The papers must be submitted before May 1, 1905. The manuscripts are not to be signed. Each will be marked with a distinctive sign at the top of the first page and placed in a sealed envelope on which the same sign will be written. A note giving the name, residence and occupation of the author will be enclosed in another envelope, sealed and bearing the same character. The two envelopes will be fastened together and placed in another envelope and delivered to the committee appointed for that purpose by the general government. The manuscripts will be examined by a commission appointed by the governor-general. The envelopes containing the manuscript will be delivered sealed to the commission and opened at the regular session. The envelopes containing the names of the competitors will likewise be opened at the session of the commission, but only after the relative values of the articles have been determined. A prize of $200 will be given to the author of the best essay, of which an edition of 1000 copies will be published at the public expense. A prize of $60 will be given to the manuscript standing second, which will likewise be published.

There are 105,000,000 cotton spindles in the whole world and of this number 68,000,000, or nearly two-thirds, are in England and the United States. Taking into consideration the use of the Anglo-American standards in other countries, it is a conservative estimate that three-fourths of the textile work of the world today is done by the English standards of weight and measure.

THE INDIAN HAND-LOOM INDUSTRY.

BY J. W. COOMBES, Chingleput, Madras, India.

The truth of the saying that people are not as black as they are painted is nowhere better emphasized than in the case of the Capitol of the "Benighted Presidency."

Madras has, strange to say, left its mark both in the educational and in the commercial world. In the educational world we are all familiar with the Madras system of education and the graphic form of writing, and in the commercial world the "Madras muslin" and the "Madras handkerchief" are well known trade terms. The object of the present article is to furnish the readers of this magazine with a sketch of the hand loom industry of India and describe in greater detail what is known as the Madras handkerchief, which forms the greatest export trade in textile fabrics in Southern India.

A great deal has been said of late about the advantages of the fly shuttle loom, and in European countries the self-shutting loom is drawing an equal amount of attention. Few, therefore, deign at the present moment to bestow even a passing glance at the primitive Indian looms, which weave those wonderfully bordered cloths, still so largely used, but gradually giving way to the competition of the Manchester-made piece-goods. Nay more, one is even apt to sneer at the simplicity of the machine. But one has only to see a skilled weaver at work to be convinced how admirably it is fitted to weave the cloths of their requirements, although the process of operation is slow. For the benefit of those who have never visited India and the Southern Presidency in particular, I propose to give a short description of the hand loom, the native method of warping and sizing and lastly the hand made cloths, of which the Madras handkerchief forms no small portion of the bulk of the trade in Southern India.

In an Indian loom the slay, which consists of a piece of hard wood, is circular in section, with a groove cut along the top for the reception of the reed. It is suspended from the roof of the house and the healds for dividing the warp by two linen cords, each cord holding by the middle a hollow slip of bamboo three inches long. Through each bamboo another cord is passed, and to the ends the two healds are attached. The warp-ends are tied in groups and a thin strip of bamboo is passed through the warp and fixed by pins into a groove, cut in a solid square beam of wood, three inches thick, called the cloth-beam. At each end there are gudgeons turned to a uniform diameter to permit it to revolve in two uprights. The right upright has a curved slot to enable the weaver to put in and take out the beam. Near the right extremity two holes are bored through the beam and at right angles to each other. Into one of these an iron rod long enough to rest against the ground is pushed to hold the beam rigid during the weaving of two or three inches of fabric, after which it becomes necessary to remove the rod from hole I to roll the cloth on the beam and place the rod in hole II. At the same time the weaver loosens a rope attached to a peg within easy reach of the right hand. This rope, which keeps the warp stretched, changes its direction at right angles twice by turning round two pegs driven into the ground. About a foot behind the healds two flat, smooth bamboos serve as lease-rods.

THE HEALDS.

These consist of a series of twine loops which are fastened to round bamboo rods. There are two rods and two series of loops which are linked together, the warp-threads being drawn through the eyes formed by linking two heald-loops.

The native-made Indian cloths are characterized by elaborate borders. These are woven by the use of special healds knitted for the particular border. These healds are manipulated by the hand and not by the feet. The cords attached to these healds each passes over a reel, threaded through a rod fixed at the top and balanced with a weight. The weaver by lifting or pulling down the weight can select the threads required for interlacing. In the case of a solid border, the weaver employs three shuttles, and loops the silk weft with the cotton at the points where the body of the cloth and the border meet.

THE REED.

The Indian makes it of very fine slit bamboos of three inches length, secured at their extremities by thin bamboos, half round in section and bound together by a cotton cord which passes between the dents or slits and round the bamboo rods. The reed is divided into a number of sections, which varies according to the quality of the cloth woven, each section being composed of sixty dents.

For 4s to 12s twist there are 10 sections in 1 yard.

TREADLES.

The treadles consist of two pieces of wood roughly shaped like the human foot. A hole is bored across the heel-shaped part and a cord passed through to form a loop. These two loops are pinned down to the ground by a peg; another knotted cord passing through attaches the treadle to the healds. This form of treadle is suited to the country loom as it is light and makes it possible for the weaver to push back his healds—an operation frequently done. Also, where only a small shed is required to make it taut.

AN INDIAN HAND LOOM WEAVER.

For 40s twist there are 20 sections in 1 yard.

For 60s twist there are 22 sections in 1 yard.

For 80s twist there are 24 sections in 1 yard.

For 100s twist there are 26 sections in 1 yard.

The reeds for silk vary from 22 to 26 sections in a yard, with the sections packed at each end to give a thick woven border. If the length of the section is one inch in the middle of the reed, at the side the section occupies three-fourths of an inch with the same number of dents in each section.

THE SHUTTLE.

The country shuttle consists of a hollow piece of bamboo-cane tipped at the ends with brass, ivory or horn. A pin inserted at one end holds the bamboo spool of weft and the thread is passed through a bent wire fixed at the other end. The skill of the weaver is brought out in the beating-up of the weft to suit the various textures of cloth. With a light slay, having the weight at the bottom and suspended from the height of the room, the weaver is able with a turn of the wrist to drive the picks close together for a heavy

cloth or with a gentle beat-up to weave the finest muslins.

TEMPLES.

The native temple consists of two bamboos each four feet long connected at the thick ends with a loose cord 2 1/2 feet long to be lengthened or shortened as required. The two bamboos are placed, one resting upon the other and crossing it at an obtuse angle. The thinner ends of the bamboos project outwards on either side of the woven cloth with six loops attached of twisted cords one foot long. Brass pins one inch in length are stuck into the edge of the cloth and the loops are passed under the cloth, into the pin, the thick end of the pin at the same time being twisted into the loop, so that the pin may not come off the loop. By regulating the position of two looped bands that pass round the bamboo temples, where they cross resting on the cloth, the necessary tension can be obtained. As weaving progresses, the last pin is taken out and inserted into the cloth where the first pin was.

NATIVE SYSTEM OF WARPING AND SIZING.

The hank is placed on a bamboo frame which revolves on a pivot and the yarn is wound from the hank to a bamboo swift. The next operation consists in fixing in the ground, in pairs, light bamboo sticks three feet long with a space of four feet between each successive pair. A stout rod is firmly fixed in the ground at each extremity to bear the strain of the warp in preparation. The warper holds a swift in his hand and passes the thread outside the first and inside the second stick of each pair, passes it round the rod at the end and returns laying the yarn in the reverse order. This process goes on till the required number of ends are obtained. Where the threads cross, lease-rods are passed, dividing the warp into two layers. These maintain the cross arrangement of the warp, which is now stretched horizontally in sheet form by inserting a roller through the loops of the warp at each end. These rollers are secured by a rope passing over a trestle to a peg in the ground.

The size, which consists of boiled rice-starch and gingelly oil, is sprayed evenly over the warp and brushed into the yarn several times in one direction alone. The threads are prevented from sticking together by men constantly separating the rods which divide the warp into two layers. The warp is now beamed into short lengths of one or two yards, according to the ground space available, in the following manner: Two smooth, stout bamboos are placed one above and the other below the warp. The upper bamboo is twisted three times together with the warp round the lower bamboo, so that the threads cannot slip between them and the rest of the length is rolled round the two bamboos. This process is repeated till the whole warp is rolled round these several sets of bamboos. The first length to be woven is attached warp end to the beam of the loom and the nearest pair of bamboos is taken, having two cords round the lower bamboos and over the upper. These cords pass round a small roller, which is supported above the ground by a rope attached to the peg, within easy reach of the weaver's right hand. As each length is woven, the next length is unrolled and stretched in the manner described, while the rest of the roll of warp is hung loosely from the roof.

THE WEAVER'S HOUSE.

Let me briefly describe a weaver's work room. The weaver's house is low and damp. The looms are generally fitted up in verandahs, round the courtyard or in the largest room by the side of a window and the light is just sufficient for the weaver to mend broken ends. The floor is clayed and cow-dunged and has a feeling of perpetual damp. The hot, steamy air in which the native works is as much responsible for the blend in the colors of the cloth as the pattern adopted. The weaver digs a pit to suit the length of his legs and the treadles are fixed to the bottom of the pit, with the warp extended over it and close to the ground. It is on an ordinary native loom that the celebrated Madras handkerchief is woven.

The Madras handkerchief, which by the way is repeatedly referred to in "Uncle Tom's Cabin," probably conveys to English speaking people the idea of a pocket handkerchief; but it is really a garment for cloth-

ing the limbs and its dimensions are two yards by one yard, woven in pieces of eight yards. It is a checked cloth of red, blue and white. The red dye used is Seruver or Indian Madder, and is generally known as Madura red. It is more delicate in shade than an alizarine red and contains a slight admixture of blue. The blue dyed yarn is indigo, the shade being fairly deep. The yarn is dipped several times into vats containing indigo, lime and a reducing agent in the shape of "Thagavarai" leaves (Cassia Tora). The yarn is allowed to remain in a heap at night and the loose dye is never washed out. This is done with an object, for when the wet weft is beaten up in weaving, the blue stripe of warp bleeds and in doing so colors the weft thread and produces a solid effect in the blue, which is one of the chief characteristics of this cloth, and which cannot be produced on the power-loom.

The local idea is that Madras handkerchiefs are woven from imported colored yarns and enquiries have been made why it is that when the imports of colored yarn have fallen to such an extent, the exports of Madras handkerchiefs are not affected. This article answers the question, for local and not imported dyes would appear to be used. A comparative statement showing imports of aniline dyes and colored yarns and exports of Madras handkerchiefs for a period of three years is subjoined.

(1). On the European hand loom:

IMPORTS.

	Colored Yarns.		Aniline Dyes.	
Year.	Pounds	Rupees.	Pounds.	Rupees.
1901-2	6,448,280	5,296,940	77,042	86,017
1902-3	6,184,791	4,986,530	65,742	71,955
1903-4	4,103,170	3,792,987	76,266	79,239

EXPORTS.

Madras Handkerchiefs.

Year.	Number.	Rupees.
1901-2	1,587,809	613,104
1902-3	1,634,974	687,309
1903-4	1,582,622	701,010

To resume the description:—The slay which beats up the weft is suspended from the roof of the house and the weaver by a twist of the wrist is able to pack the weft closely. The proportion of picks to ends is as 120 is to 80, the excessive number of picks being a feature of the cloth. The solid blue stripe in the cloth is also produced partly by raising the warp behind the healds and partly by beating up with a closed shed.

I have said that the Madras handkerchief is a check, but very frequently the checking pattern differs from the warping pattern. The African is guilty of being susceptible to

A MOHAMMEDAN DRESSED IN MADRAS HANDKERCHIEFS.

fashion and there is a constant demand for novelty of pattern. English firms are aware of this and special designs are prepared and sent out to India with instructions that there should not be the slightest deviation from the patterns supplied. The taste of the Indian also has to be studied for there are a number of emigrants who have settled down in Natal, Mauritius and other parts of Africa, the Straits Settlements, Ceylon and Burma, who welcome the Madras handkerchief, and

those woven from country dyed yarn fetch higher prices than the goods manufactured from yarn dyed with alizarine and coal-tar colors. Another characteristic of the Madras handkerchief is the fringe at the selvages of the cloth, due to the large temple-holes made about one inch apart. The temple in use by the native weaver has already been described and although constant removal and insertion of the pins retards the process of weaving, and the cloth which should have a perfect selvage is rendered faulty by the large pin holes, still the use of it is universal and will continue to be so as long as hand weaving continues.

A third characteristic is the peculiar smell of the cloth. The size used for the warp is rice-flour and gingelly oil and the smell of these ingredients combined with that of the indigo-dyed yarn produce a malodor difficult to be imitated by any English or American system of sizing. These goods are exported to London in mango-wood trunks and on the first day of an auction sale one can better imagine than describe the scene when the trunks are opened in the presence of an English crowd of buyers. A Yorkshire merchant once told me that he had "to hold his nose and clear off to a corner when a box was opened." But the Indian settlers in Africa welcome the smell, resembling, as they say, that of newly husked rice. However, it serves the practical purpose of distinguishing the hand-made from the machine-made article. In buying these goods the three characteristics mentioned are carefully looked for, and as these trade-marks are often imitated by unscrupulous manufacturers, especially on the continent, the slightest deviation from them lowers the value of the trunk.

It must not be supposed for a moment that there is a central factory where these handkerchiefs are made. They are made in households, probably separated by miles. Under these circumstances a class of agents has sprung up whose business is to secure enough to comply with orders received from large firms that ship the goods. These middlemen make advances of money to the weaver for the purchase of material and pay them a nominal value for the weaving of it. It is only in certain districts of the Presidency that this particular class of cloth is woven, and the weaver is in no particular hurry to meet the great demand that exists for the goods. He sits in his house and probably for three or four days weaves vigorously almost day and night and follows this by taking a holiday. The middleman, therefore, experiences great difficulty in supplying the merchants with their requirements in time. Sixteen designs are generally given at a time and each trunk of 64 pieces must contain all the designs equally assorted. The price paid for a cargo of 20 pieces of 40 by 40 is Rs 45 (about $15), the weight of each piece being 24 oz. For 60s by 40s the price is Rs 53 ($17), and when the texture is very close the cargo fetches a value of Rs 80 ($25); in fact, the price varies with the texture.

It may be instructive to compare the comparative cost of the handkerchief as woven on the European handloom and on the native handloom.

Size:— 64 yards × 1 yard.

4.14 lbs. of warp,	@ Rs.	1– 3–7	per lb.
7.5 lbs. of weft,	"	0– 8–7	"
Cost of warp,	"	5– 2–1	"
Cost of weft,	"	4– 0–5	"
Cost of sizing,	"	1–10–6	"
Cost of warping,	"	0–13–	"
Cost of preparing cops,	"	0– 7–	"
Cost of beaming,	"	1– 1–0	"
Cost of drawing and twisting in,	"	0– 9–0	"
Cost in weaving,	"	10– 0–0	"
	Rs.	23–11–0	

Price per piece of 8 yards = Rs. 2–15–4

On the native hand loom the weaving price works out to Rs 2-4-0 per piece of 8 yards. This is because the weaver gets his family to help him in several of the preliminary processes and their labor does not count in estimating the cost. The weaver is satisfied with a very small margin of profit, and the larger part of it, therefore, goes into the pockets of the merchant and middleman. The merchant instead of exporting the goods direct to Africa, elects to send them via London, thereby reducing the profit that should be in the hands of the people of India.

A merchant finds it difficult to try to develop the trade in other districts of the Presidency, as the weaver is a very difficult person

to deal with and he refuses to be bound by hard and fast rules and to work at stated times. Still these village industries form the backbone of India and cannot be lightly set aside or altered, for the factory system. But some middle method might be adopted with advantage. Messrs. Beardsell & Co. is the only English firm in Madras that has done anything in this direction and as the demand is greater than the supply, there is money in the business which should draw the attention of business merchants.

In a future article I will describe those wonderful bordered cloths which hold such great sway over the affections of the Hindu race.

[Samples of the Indian handkerchiefs can be seen at our Boston office.—Ed.]

PHILIPPINE CORDAGE, YARNS AND FABRICS.

Although some of the crudest and roughest of cords, cloths and yarns are turned out by the spinning devices and looms of the Philippines, any one interested in textures cannot fail to be impressed by the fine, smooth, richly colored fabrics of certain portions of the archipelago. I refer particularly to the fine silken textures of Iloilo, the gaudy colored cloths of the Moro tribes of Mindanao and the handmade patterns of the Tagalos.

In order to give the reader a general idea of the character of the ropes, cords, yarns, and fabrics of the new Philippines, I will ask him to go with me to the cordage factories of Manila and vicinity. The Santa-Mesa cordage factory is one of the most modern, and here hundreds of natives are employed in the long sheds, producing cords and ropes and hempen fabrics from the products of the Philippine soil. Then there are numerous small factories scattered about different portions of the islands. Some of these works are entirely out-doors. The natives seldom devote much time or labor to the erection of proper buildings. They prefer to work outside and quit work whenever the weather is bad. As one approaches these cordage works he observes great quantities of the hempen stuff thrown over lines of ropes, or wires, or on thin pieces of wood stretched from pole to pole or otherwise arranged to dry the flaxen fibre. The scene is very rustic and one never to be forgotten by the American traveler. A score or more of partly naked natives will be observed at work, all sexes and ages, some smoking, others chattering, and the time appears to pass easily with them. The padre of the barrio is often present, for he is interested in the commercial and industrial pursuits of his town, and he encourages the workmen. Buyers of the hempen stuffs, the cordage, and the woven textures are likewise at hand and these fellows drive some sharp bargains in making deals for the finished products of the works.

The Chinese of the islands are quite industrious folks and some of them who operate stores or cigar factories frequently put in spare hours working at the manufacture of cords or yarns for fabrics. They color the material to better advantage than many of the natives. The Chinese appear to understand the chemicals used in coloring hemp, cocoanut fibre and the wood-like strands of the jungle, and oftentimes the natives pay the Chinese to do the coloring. The majority of drugs and dyes are procured from the islands, and in almost every instance the colors are more or less fugitive. Some of the dye stuffs are imported and these are expensive, but usually hold the tint firmly. The Chinese are more industrious than the natives and one sees them making ropes and cords at all hours of the day.

COLLECTING FINE FIBRE.

It is an interesting experience to watch these natives in their work of collecting material from the forests or the jungle for the manufacture of fine goods. There are some trees in the islands, the inner barks of which are productive of fine fibres which can be arranged parallel and twisted by hand into strands for dyeing and weaving. The "Bacooyey" wood is one which can be split into numberless lengths, each piece being reduced to the fineness of a thread almost, and yet the fibre retains sufficient strength to permit weaving. These wooded-strands are not dyed, but polished with the oils of cocoanut and the degrees of polish with the oils determine the shade, whether it be light or dark.

The polish is heightened after the threads are woven into a texture by the addition of gummy stuffs which are liquefied and rubbed on.

Our illustration shows prospectors in the country who are looking about for raw material for the textile industry. Your correspondent has met with and interviewed some of these men: they report good results so far as discovering singular formations of natural growths for strand making is concerned.

MAKING ROPE IN THE PHILIPPINES.

They find woods possessed of pliable qualifications which can be shaved down to the fineness of thread and woven. The natives use this wood for basket making. There is a mahogany-like stock which is suitable for this service and which is utilized in the construction of flaring garments for the sultans, the dattos and the rajahs of the Sulu group.

There have been some important steps taken in the manufacture of the cocoanut fibre goods of the islands. Formerly it was customary for the natives to collect the husks of the cocoanuts and cut off the fibre portions, dry and work the same into a sort of a thread by rolling or by twisting with crude homemade devices. The resulting threads were exceedingly irregular and coarse. Recently some American machines have been introduced for combing the fibre, and, although the fibre is spun into threads as before, the combing process has greatly improved the operation, so that it is possible to spin some very regular threads of considerable finer grade than ever before. The brown fibred stock is colored black, blue and kindred tints with proper dyes, so that a variety of dark colors is possible.

The manufacture of jusi cloths from the fine fibre of the pineapple has assumed important proportions during the past year or more. Formerly the trade was restricted to the demands of the well-to-do people of the islands and pieces of from forty to fifty yards each sold at about twelve to fifteen dollars gold. The width of the stuff is about 24 inches. It is exceedingly fine and attractive and has been exported to American markets quite freely lately.

Since the Americans occupied the country, tailor shops have sprung into existence and these jusi fabrics are now made into fine garments for men as well as for women. The extreme lightness and delicacy of these cloths make them valuable for service in the tropics. No cloths like these are made in any other country and because of this, dealers who are buying up the goods here reap good profits on lots sent to the United States.

Most of the makers of the manila ropes, cords and twines, and the weavers of the fine cloths are not aware of the fact that machinery is built for doing the work mechanically and with speed and uniformity. These textile workers of the Philippines have never been far away from their homes and have no knowledge of the improvements in the world. Yet some of these owners of cordage plants and loom shops are quite wealthy. They could and would purchase readily the necessary labor-saving devices if the same were called to their attention. I know this because after speaking with a number of operators of hand-loom shops and street cordage works, I was requested to arrange for the shipment of the necessary machinery to the works, and was assured of payment for same in advance or upon arrival. Power is obtainable from falls which usually prevail in these manufacturing centres, or from steam plants.

The 840-yard English system is the standard for cotton yarn throughout the world except France and Spain.

COTTON MANUFACTURING IN MEXICO.

The following figures published by the Mexican Herald, of October 9, 1904, and evidently extracted from the Government's most recent statistics, show the status of cotton manufacturing in Mexico for the year 1903: Factories for the spinning and weaving of cotton, 113; for the weaving and stamping of cotton, 10; solely for the stamping of cotton, 9; total cotton manufacturing plants in Mexico, 132. The year's consumption of cotton in Mexico was 30,263.22 tons. The number of pieces of cotton manufactured during the year was 11,606,105; length of cotton stuffs, in yards, 348,183,050; spindles in operation, 632,601; looms, 20,271; stamping machines, 35. These machines were valued at $4,007,500, United States currency. There were 26,149 persons employed in cotton factories, the sales of the products of which during the year amounted to $12,323,442.18, United States currency.—James A. LeRoy, Consul, Durango, Mexico.

TEXTILE ADVERTISING THAT HAS SUCCEEDED.

[This is the first of a series of articles, which will be stories of certain tangible success in the advertising of textiles along the lines advocated by the series of articles published last year. Last year Mr. Balmer discussed in a series of six articles, treating, the necessity and possibilities of textile advertising; the planning of the advertising campaign, and general publicity and work upon dealers, and followed these with a series of six other articles, each article being an investigation into the present state of the sales of six leading textile lines. This was theory, even though it was theory born of experience. The new series will treat of actual successes—no theory at all, but fact—something that has happened. They are living instances taken from every day advertising life, and examples of the application of the theories that have formed the subject matter of the preceding articles.]

Every civilized soul requires some form of stocking or covering. Consequently there are many hosiery and knit goods companies in the United States. In 1900 there were 921 establishments, with combined products valued at over $95,000,000. Today there are several hundred more.

Eleven months ago there seemed to be enough companies running to supply the demand. In fact, there did not appear to be any demand for a new hosiery concern, and certainly not for a very large one. Nevertheless, in the spring of 1904 a new company was formed and one whose plans were by no means diminutive—a company whose plans and progress are so fitting an illustration to my hosiery arguments in the December number of this series that I have selected it as the first example of successful textile advertising.

The Buster Brown Stocking Company had no auspicious beginning. It had no more chance in the textile world than any of the other hosiery manufactures. In fact, it was really founded by a seven-year-old boy. The lad was looking through the comic pages of a Sunday paper one evening. After being amused over the antics of the famous Buster Brown, he jumped up and ran to his father with this happy suggestion: "Papa, if you make a darn good stocking and call it The Buster Brown, you will sell a pile of them." "Papa" was Herman H. Sanders, and this idea was eleven months ago, The Buster Brown Company's only capital. Today this stocking company is known in thousands of homes. They are selling "a pile of them"—yes, even at the rate of 50,000 dozen a month. Their goods have been distributed throughout the country and they have a following of customers who insist on the Buster Brown Stocking and no other kind.

Such a success in less than one year looks at first to be phenomenal, but when we consider the cleverness of the fundamental idea, the real personality of the copy, and most of all the breadth of the plans, the company's growth is more understood. There was nothing small about the campaign, or the men behind the campaign, and the result has been correspondingly large.

In the first place, Mr. Sanders recognized the real advertising value of the Buster Brown idea. He knew very well that there are hundreds of brands of stockings, and that a stocking is a staple article and that most women go to the store to buy stockings without any definite idea of the kind they want. Women have no particular way of identifying the kind they last bought, though they found them to wear well.

The real worth of this name and of the

Buster Brown idea lay in its advertising possibilities.

Being no stranger to the hosiery business, Mr. Sanders had manufactured for him a boy's stocking of good texture—one that would stand the strain of a growing, healthy boy. But at this juncture he found himself greatly handicapped by lack of capital. So the whole idea was mapped out and the plans laid before Allan M. Hirsh, a banker of New York. Mr. Hirsh saw that the idea, to be made good, must be promoted extensively as well as intensively. On the tenth of April, 1904, the company was launched, and in a little over a month the stockings were placed on the market.

Albert H. Whitmore, "the father of the life-sized doll," undertook the advertising of the company, and to him the credit can be given for the successful career of the enterprise. He saw that the advertising, to be built up around the name of Buster Brown, must be developed with copy that would appeal to the children as well as the mothers. To reach these members of the family he must advertise in the fashion publications, and those that were distinctly home publications. He selected such magazines as The Butterick Trio, whose readers are known to be the mothers and young folks of the home. With a 59-line double-column announcement Mr. Whitmore began in the Butterick publications. This was increased to an entire double column in the December issue of 1904, and to a page in January, 1905; while the fourth cover of The Trio was taken for February, 1905.

Concerning this increase of space Mr. Whitmore says:

"It is true that if we used a 56-line ad, a woman would think we were a 56-line proposition; and if we used a column she would say they look pretty nearly like the real thing, but if we take a page, we command respect, and we keep it, too. After we used double columns someone told Mr. Balmer that we had some money left and he said, 'You want to take a page.' So we took a page and ran it, and we haven't any complaint coming. We believe that it is better to pay a man $5,000 a year if he can earn you $40,000 than it is to pay a man $1,500 a year who can't earn you more than $2,000, or who possibly can't earn you anything."

This magazine space was filled with copy which talked directly to the children. The personality of Buster Brown was cleverly brought out. His antics and escapades were described and drawn by the artist, R. F. Outcault, of Yellow Kid fame, who is the author of the original Buster Brown. This story was continued from month to month to appeal to the children, until Buster was soon regarded as a living personality. The talk was in a very natural and amusing manner and soon won their attention, their confidence and their mothers' trade. The youngsters themselves often answered the advertisements, and some very funny little letters were received by the advertising manager from children all over the country.

Toy novelties were used in the various advertisements as inquiry-bringers. The Buster Brown drawing-book, the weighing-machine, the funny little rubber stamps and the pocket-book attracted the children's attention. A small price was set upon some of these toys, but this did not seem to affect the demand which poured in at the rate of several hundred a day during the first weeks of the appearance of the advertisement. Of these inquiry-bringers, the unique drawing-book and paint-box given away with every pair of stockings attracted the most attention, but every one of these pair of stockings sent out with a drawing-book was done so at a loss—26 cents being the exact cost of both. However, all this proved good advertising for the firm and served toward interesting the children until they became fast friends of the company. In fact, not a few mothers wrote in, requesting the company to stop advertising, because the children would read these advertisements and would insist on having the Buster Brown brand of stockings and no other.

But had this been the only form of follow-up used by this company, they would, with all these clever schemes, have found it deficient. One of the conditions placed on the little readers before they got these novelties was that the name of their dealer should be sent. The dealers were then written to and shown how they would have help by the

extensive magazine publicity undertaken by the Buster Brown Company. Reprints of the advertisements and other interesting matter were circularized.

When a woman wrote in requesting stockings her letter was sent to her nearest dealer, and she was asked to inquire there for the Buster Brown Stocking. If the dealer wrote back that he had stockings to burn, advertising was placed in the local paper of the Buster Brown Drawing-book and other of these novelties, and a demand was soon created. Generally the dealer wrote back that he would try a few pair of Buster Brown brand. This often resulted in a reorder of several times larger size than the original order. The "Fair" in Chicago sold 15,000 Buster Brown stockings in 7 days across its counters. The demand on the dealer created by this magazine advertising generally resulted in increased orders. However, if the dealer did not send in a reorder, an advertisement similar to the magazine copy, offering the drawing-book and rubber stamps was inserted in the local paper and after this the dealer generally contented himself by taking advantage of the business which had been stirred up for him.

The 5 per cent. gold bonds scheme is perhaps a better idea than the novelties. The child whose mother buys the stockings is encouraged to keep these coupons, one of which may be found in every stocking, until he has coupons amounting to twenty dollars' worth, which means the purchase of 80 pairs. When the child returns the 80 coupons he gets $1 for them. The use of the novelties was all right to attract the children's attention, while this coupon scheme is better to keep up the demand.

Since the recent magazine advertising this winter the request for stockings have been rolling into their office at the rate of over 1,000 a day. Such returns have prompted The Buster Brown Company to spend $31,000 in the coming year in The Butterick Trio alone—the largest sum ever expended by a single advertiser in these publications. The simple story of how this advertising brings results, and why this is done, is best summed up by Mr. Whitmore when he said to me one day:

"We cannot go to work and put out men all over this country as cheaply as you can put out your magazine, because you ship your magazine to a great many places where our men could not go. Therefore, we use your magazine."

A good article, a good definite plan, appropriate copy, sufficient space in the right kind of mediums and a good (can't be too good) follow-up system, these are qualifications that account for this advertising success: and indeed because they are the prime conditions, be considered the secret of all advertising success.

Nothing has been done by this textile advertiser which cannot be done by any other. There are about 16,000,000 families in this country, and in every one of these homes there is some demand for stockings—in most of them for children's stockings, and, of course, there is also a demand for all other articles of wearing apparel. From my recent investigation among Trio readers I found that 35 per cent. of the readers of the Delineator family were young folks between the age of five and twelve. That means that there are about 3,000,000 children in the homes where the Butterick trio goes.

Of the 16,000,000 families in this country, over 5,000,000 have an annual income of $400. This would leave a little over 10,000,000 of the desirable class. A combination of good home magazines could be made to reach at least one-half of these families. If you have a good article and a good method of advertising, you are bound to get your percentage of this trade. Just how large that percentage will be, of course, depends on the methods you employ to get it.

Of course, no advertiser can exactly imitate the plans of the Buster Brown Company and succeed, but there are certain fundamental laws in their plans which can be followed and which will insure the same success, if used persistently. And they are the same that I have laid down in the previous articles of this series. There is a plan for every article that can be advertised—one that will sell that article and sell it successfully, but no plan can insure large sales which does not require an adequate amount of publicity in the magazines that reach the home of the consumer.

THOMAS BALMER.

TEXTILE PROCESSES.

EDITED BY E. A. POSSELT.

PRACTICAL POINTS ON JACQUARD DESIGNING.

Single cloth designing in which separate figures are produced by means of warp and filling floating, the ground being formed by closely interlacing both systems of threads.

This system of designing is best explained by means of the accompanying sketch, Fig. A, designed to illustrate—actual size in cloth—a silk fabric to be constructed with a texture of 277 warp threads × 111 picks per inch.

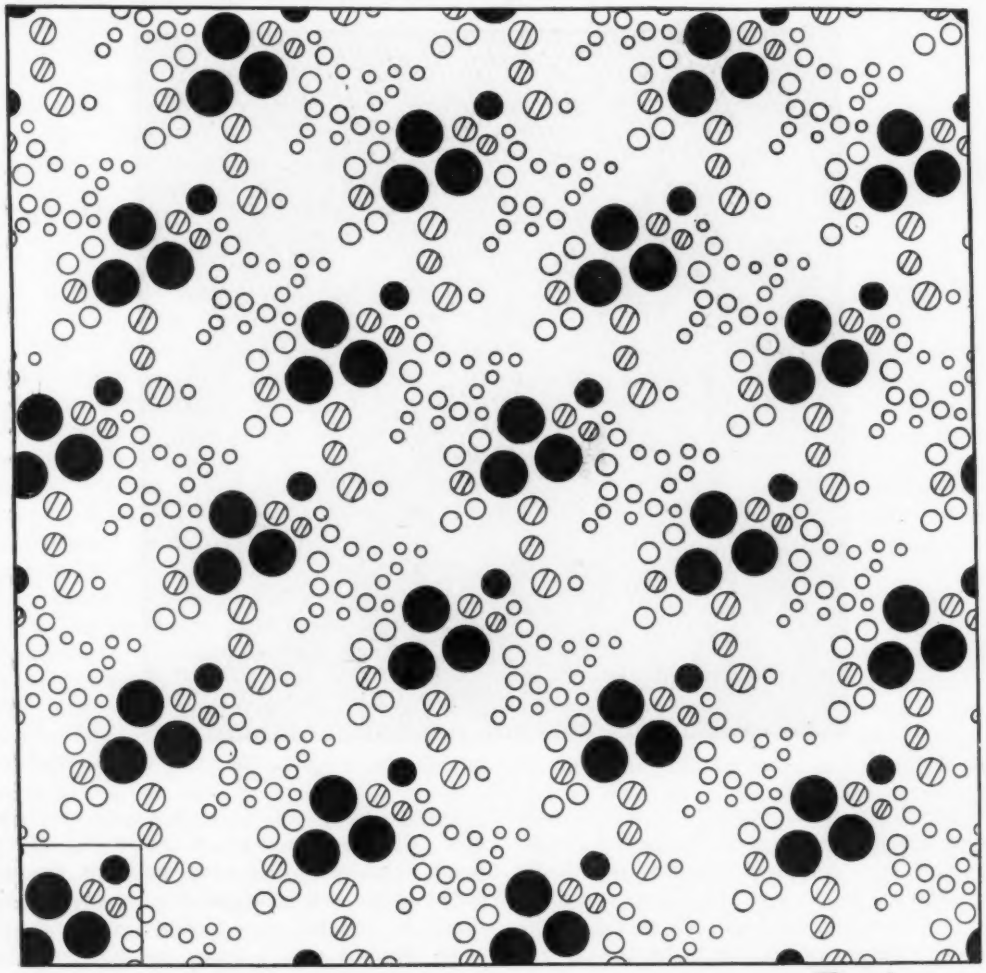


Fig. A

The sketch in itself illustrates the practical application of circles of different sizes to form a design after the 5-leaf satin setting.

Four repeats (2 each way) are given to better illustrate the effect of this kind of setting circles or spots.

Repeat of design 2 1/6 × 2 1/6 inches.

Size of jacquard to be used is (2 1/6 × 277 =) 600 machine.

Proper point paper to be used is (277 : 111 :: x : 8) or as near as possible (277 : 111 :: 20 : 8) 20 × 8 is the proper point paper to be used.

To illustrate the proper working out of the sketch on point paper, the accompanying design, Fig. B, is given, being the 1/16th part of the complete design practically worked out on 20 × 8 point paper, calling for 150 warp threads and 60 picks of the complete design of 600 warp threads × 240 picks.

This worked out portion, Fig. B, of the complete design is indicated on sketch Fig. A, in its lower left hand corner, by means of square a, b, c, d.

Design Fig. B shows—what we may call filling up, thus we must use at the card stamping □ for warp up or "cut," ■ = filling effect or "missed."

Examining our sketch of fabric, Fig. A, we find two different effects used for showing up the figures, viz.:

First figure effect is shown in full black circles; these we selected in design Fig. B, for being produced by floating the filling, stitching the latter by means of the 16 leaf satin. This is our prominent effect.

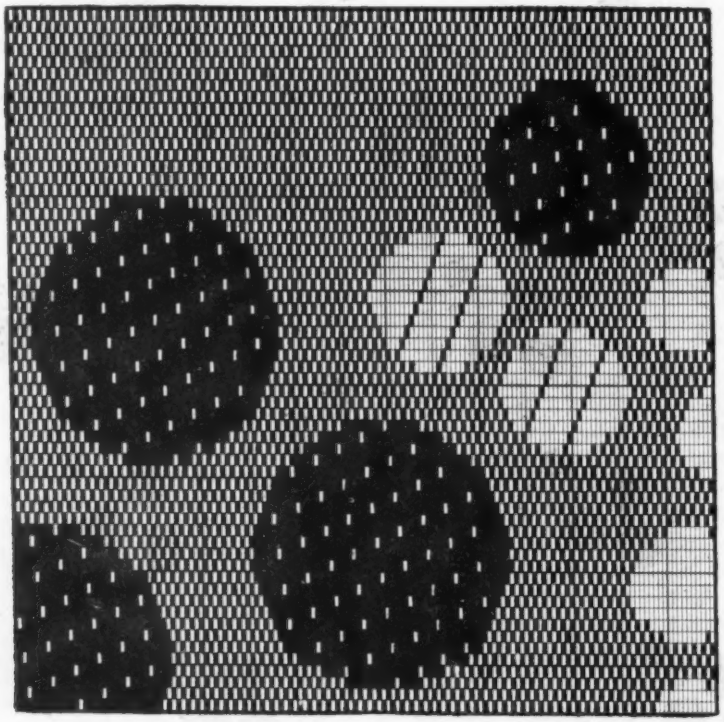


Fig. B

Second figure effect is shown by gray circles; these we selected in design Fig. B for being produced by floating the warp. On account of the low filling texture, compared to that of the warp, we have to stitch those warp threads which have too excessive a float. This point has been clearly demonstrated in sketch, as well as design, by running a double twill over all the larger circles, i. e., adopting about 11 picks as the longest warp float. Such circles as contain a shorter float than 11 picks, i. e., are less than 1/10th

of one inch long in the cloth, are not touched, i e., are simply produced by warp floats without any binding to the filling. This effect is designed to form more of a background on the cloth to the first mentioned effect.

The ground weave is the common plain weave, which, however, on account of the low filling texture, as compared to that of the warp, will give to the fabric a rib ground, similar to its appearance on the point paper.

Although our example shows separate figures for warp and filling floating, this style of designing is just as applicable to the combination of both effects to one figure, especially when dealing with larger, or floral designs.

THE MANUFACTURE OF SILK FROM FIBRE TO FABRIC.

VI.

"Singles" is the name for all raw silk composed of a number of silk filaments twisted together during the reeling of the silk. Since each cocoon supplies a double thread, consequently if four are reeled together the singles actually contain eight filaments, if five cocoons are reeled together, ten filaments, etc. The silk in this stage, as already previously referred to, has a coating of gum (the reason why the yarn is termed or known as "in the gum") which adds considerable to its strength as well as elasticity, for which reason in connection with piece-dyed goods like plain and figured pongees, satins and similar fabrics they are as a rule woven with the silk in the gum state, the fabrics being un-gummed or the gum boiled off afterwards. This, however, is not possible in connection with fancy colored fabrics, although in the latter instance in many cases such yarns are dyed without boiling off, a feature which, however, is done at a sacrifice of the lustre of the yarn or resultant fabric, so highly valued in connection with silk.

Singles silk will produce a cloth which possesses a softness and brilliancy unattainable with silk which has been twisted; i. e., tram or organzine, a feature which at once will demonstrate to manufacturers the advantage of not imparting to silk any more twist than is absolutely necessary on account of scouring, dyeing and weaving processes.

However, previously to using singles silk by the mill, the same as a rule, with the exception of Italian silk requires:

"Cleaning." In this process the silk thread is simply transferred from one bobbin to another and passes during the transfer through the cleaner, which consists of two sufficiently close parallel plates to catch any irregularity upon the silk and at the same time arrest the motion of the spindle until the operator removes the cause.

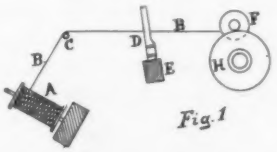


Fig. 1

Fig. 1 illustrates the principle of this cleaning process. The bobbin, A, containing the raw silk is unwound, the thread, B, passing over guide rod, C, and the cleaner, D, which is fixed in guide rail, E. The thread, B, is wound upon the bobbin, F, which is turned by friction roller, H.

"Tram" silk is the union of two, three or more singles only slightly twisted together and is known either as two-thread tram, three-thread tram, etc., according to how many singles are used in the compound thread.

It will be readily understood that the union of the singles into tram should be accomplished with as little twist as is possible, since twisting is done at an expense to the lustre of the yarn and resultant fabric, as well as imparting a harder feel to both. Again it must be kept in mind that the less twist the better the "cover" to the cloth woven, i. e., the less the individual threads composing the fabric will reveal themselves to the naked eye.

Tram as a rule is used boiled off and only rarely in the gum, being degummed before dyeing in the hank. By information thus imparted we have shown that a variation in twist will cause a variation in the lustre; therefore by making use of this item, i. e., using two different twisted yarns to bring

out the principal parts of a design in connection with uni-colored cloth.

"Organzine" silk is the union of a two-thread tram yarn with a great many turns per inch and is chiefly used for warp, the amount of twist given the silk depending upon the texture and weave of the cloth, i. e., the higher the texture and the tighter the weave the more twist required for the organzine; however, the affair must not be overdone when lustre is an important factor to the fabric, although in connection with some fabrics like for example umbrella cloth, strength may be the most important item to be aimed at in the construction of the fabric.

"Doubling." The machine used for this work is known as a "silk doubler," the accompanying illustration, Fig. 2, showing a specimen of such a machine (frame) in its

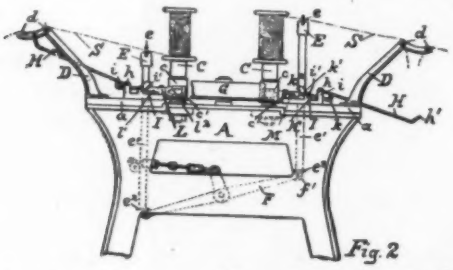


Fig. 2

side elevation, one side of the illustration showing the frame in its working order, the other side showing the parts of the machine in the position they occupy upon the breakage of a thread. The device for adjusting and regulating the traverse for the thread during winding being also shown.

Examining the illustration we find on the tail board, a, as mounted on each side of the frame, A, of the machine, secured a bracket, D, carrying bars, d, over which the threads, S, pass to their respective guide eyes, e, as secured on the traverse bar, E. These traverse bars (one on each side of the doubler) are moved up and down alternately by the rocker, F, provided at each end with a roller, f^1, for engagement with the shoulder, e^2, on the arm, e^1, of the traverse bar.

The spindle, C, has a lower portion, c, on which is a shoulder, c^1, said spindle being operated by friction pulleys driven by a belt on pulley, G. The stopping device, L, has a straight end, l^1, and the curved end, l^2, which is provided with a roller, a spiral spring, M, pressing against the straight end, l^1, thereby causing the curved end, l^2, to go between the belt and the spindle, whenever a thread breaks. On the stand, I, are two uprights, i and i^1, in which are respectively pivoted the levers, K, and the fallers, H, provided with an eye, h, and a hooked end, h^1. The lever, K, which is pivoted in the upright, i^1, has an upturned end, k, and a straight portion, k^2. The hooked ends, h^1, of the fallers, H, rest on the threads, S, when the machine is in operation, and the spiral spring, M, presses the straight end, l^1, of the stopper, L, against the end, k^2, of the lever, K, and when the thread breaks, its faller, H, drops on the upturned end of the lever, K, which releases the lever from engagement with the end of the stopper, L, forcing said lever laterally, throwing the curved end of the stopper, L, between the belt and the spindle, thus stopping the revolution of the spindle.

Spinning and Twisting. This operation is done on a machine known as a "silk spinner and twister," being a machine in which the thread, after previously "cleaning," it is wound from one bobbin onto another, at the same time putting "twist" into the thread. In connection with the spinning and twisting devices of the machine there are as a rule combined with it two stop motions, one for operating the fallers when a supply thread breaks, the other acting to stop the supply bobbins (and this without operating the stop motion first referred to) at the moment when the shipper lever is shifted onto the loose pulley.

Fig. 3 shows such a silk spinner and twister in its end view, clearly showing the several mechanisms previously referred to, one "bank" of the machine only being shown in order to simplify illustrations. If dealing with a double-bank machine, the spinning and twisting devices, with its "faller stop motion" and "kink preventers," as shown in the single-bank machine, being simply duplicated for the other side.

Examining our illustration, A indicates one of the side frames of the machine, on which is mounted the spindle rail, B. In this

spindle rail, B, are mounted the two series of spindles, C and D, one series carrying the supply bobbins, C^1, and the other carrying the bobbins, D^1, onto which the thread is wound. From the bobbins, C^1, the thread passes up and around guide and feed rollers and thence down to the bobbin, D^1, on which it is laid by a ring traveler mounted on the ring rail, E, said traveler putting at the same time the required twist into the thread.

The fallers, F, of the "faller stop motion" normally remain in vertical position (as shown in the illustration), i. e., resting against the faller stand, G, but if a thread

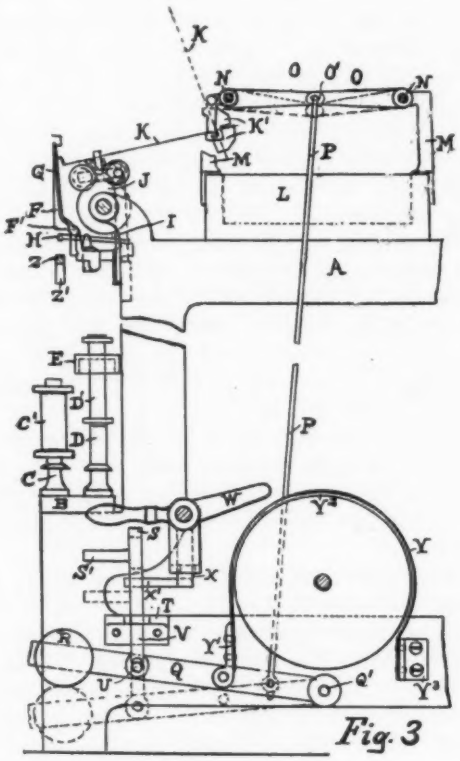


Fig. 3

breaks on its passage from one bobbin to the other, said faller drops down so that the portion, F^1, engages with the end of lever, H, rocking said lever and bringing its tooth, I, into engagement with the driving roller, J, and thus (through intermediate connections) stop the machine. With this stop motion is combined another stop motion, acting either in connection with said faller stop motion or independent when the machine is stopped by the operator.

This second stop motion arrests at once the rotation of both series of bobbins and simultaneously throws the lever, K (technically called a kink preventer), upward, carrying any paid-out supply thread up with it, thus keeping the threads from becoming slack and forming kinks which always are a disadvantage to perfect yarn.

On each end of the bobbin-supply box, L, as mounted on top of the frame, A, is secured a bracket, M, in which are formed bearings for a shaft, N, which extends the entire length of the machine, and has mounted on it the weighted levers or kink preventers, K, said shaft having at the driving end of the machine secured to it an arm, O, provided with a hole, O^1, into which is hooked one end of a rod, P, having its other end secured to a lever, Q, pivoted at Q^1, to the frame of the machine, and carrying at its outer end a weight, R. At about its middle portion the lever, Q, is provided with a stud, U, which enters a hole in a latch, V; said latch slides in a slotted bracket, T, and has at its upper end a hook, S, and handle, S^1. On the frame of the machine and above the latch, V, is mounted the slipper lever, W, formed with a part, X, and extension, X^1, the latter being adapted to engage with the latch, V.

A shoulder on the inner end of the bracket, T, holds the latch, V, and, in turn, the lever, Q, in raised position (see full lines in illustration), as is the case when the machine is running, but when the machine is stopped for any cause whatever, the extension, X^1, of the shipper lever, W, engages the latch, V, and forces the same from its notch in bracket, T, thus allowing the lever, Q, to drop into position shown in dotted lines.

To the lever, Q, is also secured a brake band, Y, by means of a buckle, Y^1, said brake band extending over a brake pulley, Y^2, fast to the driving pulley of the machine (not shown), provided the same is driven by means of fast and loose pulleys, or to one of the friction members in case the machine is driven by friction device. At its other end, this brake band, Y, is fastened to bracket, Y^3, thus when the lever, Q, drops, as previously men-

tioned, the brake band engages the brake pulley, Y^2, and thus immediately stops all running parts of the machine.

On the dropping of the lever, Q, the rod, P, is simultaneously pulled down, which in turn causes the shafts, N, to be rocked, causing the balanced lever (kink preventer), K, to be tipped so that the weight, K^1, is overbalanced and the lever, K, raises (to the dotted line position shown), carrying the thread with it, and thus prevents kinks in the yarn.

In order that the operator is able to stop the machine without the faller stop motion to operate, a bar, Z, is provided extending all the way across in front of the machine, resting on support, Z^1, and adapted to be brought in contact with the ends of levers, H, to thus control their operation.

To stop the machine, the operator first raises this bar, Z, and next knocks off the shipper lever, W, which drops the lever, Q, and in turn operates, as described, to throw the levers, K, upward simultaneously with the stopping of the machine.

FULLING AND THE MACHINERY FOR THE PROCESS.

(Continued from February.)

The water as used in preparing the soft soap for fulling (and, consequently, for scouring purposes) must also be considered, since if said water contains lime, salts of magnesia, etc., it will decompose the soap, and consequently interfere with the fulling as well as the cleansing of the goods thus treated. It is thus a very important point to determine the quality of the water to be used in preparing the fulling liquor, or to be added to the fabric if so required, so that the proper source of any trouble in further departments of the finishing room is properly accounted for. To commence with, if the fulling liquor is made up of hard water, as mentioned before, the soap in this instance is rendered partly useless. Some finishers may claim that the excess of soap, always given for a bath, will counteract the effect, but this is a mistake, not only on account of the loss of soap, but also that what is left is lime soap, which is of little or no use. Such soap during fulling (as well as scouring) will continually separate, and the cloth will, despite all efforts, have a harsh, raspy, dry feel.

Examining the cloth during or after fulling will show no soap froth, but in place of it a thin, weak lye; again soap has to be continually added, and even with this expensive remedy, the cloth will continue dry.

After fulling then comes the difficulty of trying to remove these additions by excessive washings, and finally the result, a hard boardy fabric, too smooth to the feel or touch of the hand. The more fat there is used in the manufacture of the soap, the worse is the effect of hard water. Water only slightly hard, may be softened by boiling, whereas very hard water, provided it is the only one at our disposal, may be softened by boiling, provided bran is added and which then is removed before using. Wyandotte textile soda is an excellent medium for preparing hard water for fulling and scouring purposes.

In dealing with a fabric requiring gigging or napping, the influence of using a hard water is everlasting, for if the wool fibre is rendered hard by the water, the felt cannot be easily loosened on the gig or napper, nor can it, under any amount of work, be made as open and soft as it ought to be, or as it would be, provided soft water had been used. If such a case occurred, the only way to remedy the trouble somewhat would be the free use of moderately warm condensed water.

Soft water will even harden the goods if they are allowed to remain any length of time in a wet condition, and naturally hard water, under the same conditions, will aggravate this trouble. This explains why any piece of cloth if gigged or napped at once after fulling and scouring, can be handled easier, quicker, and will be more effective than if the fabric is allowed to lay in a wet condition for hours, or possibly for days. Now if this is the case when using a soft water, how much worse would it be if using a hard water. For this reason it must be remembered that the fulling of fabrics should under no circumstances be too far in advance of the gigging or napping process—both must go hand in hand for good results in the

finished goods—and if for any reason the napping or gigging department falls behind the fulling department to any extent with their work, then the goods, after scouring, are better dried temporarily, especially when dealing with fabrics calling for a soft, pliable, velvety final finish.

After the goods have been soaped in the fulling mill, and allowed to run long enough for the soap to spread and evenly wet the goods, the time for their first examination has arrived. The goods running in the mill should be examined at stated periods to see if they come up even both ways, for if lacking in either respect, this must be attended to at once. If the goods do not come up in length as fast as they should, more weight must be applied to the trap, but if the supply should be exhausted, as will sometimes happen, then the pressure of the roll must be lessened, and in this way the shrinking sideways retarded so that the goods may have a chance to come up lengthwise by the time they have sufficiently shrunk sideways.

After thus examining the goods, it is a good plan for the fuller to scrape off, more or less, any soap which has spattered on the sides and other parts inside of the fulling mill, and put such soap back on the goods, thus not only keeping the inside of the mill in a better condition, but at the same time use the soap to its full value. Soap if deposited in quantities and for time on the metal parts of the machine tends to corrode them, and if left on them to dry, will form a hard scum which in time will become detached and fall on the goods, and in passing through the rolls is apt to do damage, however slight it may be. The accumulation of soap on the wooden parts of the machine will exert a tendency to warp them more or less, a feature readily seen when the doors of the machine will shut hard, hinges rust off, etc.

If goods are flocked, all the flocks and waste matter coming from the mill must be taken care of, i. e., away from the machine—to wherever they belong.

The sewing together of the ends of the fabric or fabrics, after they are put into the mill, must be carefully done, making the seam firm and smooth, whether made by hand or by machine. In connection with hand stitches, take small and even stitches, whereas in connection with machine seams, see that the seam is not made too deep into the cloth, and thus bulky, in turn creating a pounding each time such a seam passes between the rolls. Have the protruding ends of the seam turned inside, for this will greatly help its smoothness.

Pressure in a fulling mill for shrinking the fabric either way must be put on easy and a little at a time; this will be found far better than putting on full pressure at once, for the fact that in shrinking the cloth too suddenly, good felting is lost sight of. By taking this precaution, the goods, when finished, will not looked starved, nor handle hard and wiry. If the goods shrink too slow in width, ,a little additional pressure put on to the top roll, will help, the same as additional weights on the trap will help to shrink the fabric in its length, and vice versa in both instances.

Provided fabrics come up continually too fast in their length, it is a good plan to somewhat draw down the rods of the elliptic springs and thus increase the pressure of the rolls. But if this does not help, then the best plan is to double such pieces in the mill, thus increasing the volume of cloth at one time under the influence of the rolls (more pressure exerted), and at the same time shortening the piece by one-half, and when consequently the goods will be under the roll oftener than if they were single. Running the goods thus double will mostly bring them up in width, in a reasonable time.

On light weights, two (or three) pieces, side by side are generally run in the mill, in this way not only increasing the production, but at the same time the goods will run better all around.

If the goods are fulling too long, take them out and reverse the ends in the mill, and when they have run about half time, shake them out thoroughly from end to end.

Wrinkles are formed in the pieces during fulling by allowing them to run too long at one time without examining them, or without sufficient soap, according to the nature of the weave. The remedy is to take the pieces out, shake and straighten, and in sewing the ends together, have the stitches close.

Heat is an agent necessary to the felting of the wool fibre; however, care must be taken to avoid too high a temperature during fulling, since such would seriously injure the colors—about 85° Fahr. is a good average, possibly 90° Fahr. as a limit—again there are some classes of colors very sensitive to heat, and which consequently must be treated at a lower temperature, according to fastness of color to fulling.

Heat influences moisture, and consequently as the fabric gets warm in the mill, a good deal of the moisture then in or on the fabric will evaporate, and since it will not do to let the cloth run too dry, i. e., short of soap (since then goods will chafe, resulting in loss in weight and creating more flocks—neither will the fabric thus fulled, gig or shear clean and clear), the fuller as soon as he sees that the pieces are not as wet as they should be, must at once add a little more soap, however, remembering that it will not take much to bring them again to their proper moisture. If it should occur, either through carelessness or otherwise, that too much soap has been applied to the fabric, then the best remedy is to run at once, and quickly, a dry fabric in the mill, and which at once will absorb any surplus of soap from the fabric under operation, though it must be clearly undertsood that without sufficient soap and heat goods will not felt—shrinking may be got without felting, but this is not proper fulling.

As soon as the fabric is up in its width and length, the fuller must test the soap in the fabric, and in every piece provided two or more fulled at one time, to see if it has turned watery or not. When the pieces are handled, and a gentle squeeze given, a little free soap should appear; this is a test that sufficient has been used, or that the soap has not lost its vitality by too long fulling. This must not be omitted, it will save trouble. In any case where the soap does not show up as thus mentioned, give the pieces an additional dipperful of soap before taking them from the mill, which will then help them in the washer.

When the fabrics are then taken out of the mill, remove the tacking strings, provided the goods had been tacked, after which, except they can go at once in the washer, open them out so that the air can get at all parts of the fabric, since they are then warm, and if left lying in piles would start the colors and dull them. This airing in connection with goods to be piece dyed will also prevent the formation of streaky and cloudy places there.

Cockles are an enemy with which we have to deal in finishing. They may be made elsewhere than in the fulling mill, but at the same time they are also made in the fulling mill. Uneven soaping will do it. Having the pieces run too dry, or too weak a soap, will also make them; for where the soap goes on directly, the grease will start; but the parts that have to depend upon soap, by absorbing from the more moist places, will not get enough to start the grease, therefore the piece fulls uneven.

TO PREVENT COLORS FROM BEING AFFECTED.

In the fulling of cheviots and shoddies a single colored piece—in washing, a cold solution of very mild soap ought to be poured upon the goods, and warm water or lyes avoided; wash well, whiz well, and place in the fulling mill. The cloth is then fulled quickly, and without loss of time in the cold condition with hard soap; rinse, whiz well, dry at once, or gig. The cloth in this case ought not to be left in a wet condition for any length of time, nor hung up, and if it should be found that the colors are in any way affected, they may be touched up in a sulphuric bath, which, for convenience, can be done in the same wash machine in which the rinsing is done after the fulling, and, if the water shows clear, the cloth can be taken out, the bath soured with sulphuric acid, and, if many colors show pronounced in the fabrics, the bath may be made a little sharper in taste.

A FEW CALCULATIONS.

Cloth always comes from the looms more or less uneven in weight, so that all goods of one style may be shrunk in proportion by using the following calculations:

Example: Loom weight of fabric 19 oz. Finished weight required 17 oz. Losses in grease napping, brushing and shearing 18 per cent., leaving 82 per cent. to be dealt with.

Thus 19 × 0.82 = 15.58 oz. × 36 = 560.88 ÷ 16 = 35.05 inches, and 36 inches — 35.05 = 0.95.

Answer 0.95 or practically 1 inch is the amount per yard shrinkage required to bring up the fabric in question to the weight (17 oz.) required.

Another Example: Loom weight of fabric 30 oz. Finished weight required 25 1/2 oz. Loss in scouring, gigging, brushing and shearing 30 per cent. Shrinkage in length 3 per cent. How much flocks have to be added to the fabric—fulled onto it—to bring it up to weight required.

30 × 100 = 3000 ÷ 97 = 30.92 stock per yard, plus shrinkage in length; and 30.92 × 70 = 2164.4 ÷ 100 = 21.64 oz.; and 25.5 — 21.64 = 3.86.

Answer 3.86 oz. practically 3 7/8 oz. flocks must be fulled onto the fabric; how much flocks to use to get this result depending on the kind of flocks to be used.

Another Example: Loom weight 16 oz. Shrinkage in scouring, etc., 20 per cent. Shrinkage in length 5 per cent.

Question: Ascertain weight of fabric finished.

16 × 100 = 1600 ÷ 95 = 16.73 and 16.73 × 80 = 1338.4 ÷ 100 = 13.38 oz. or practically 13 1/3 oz. weight of fabric finished.

There are, of course, instances where an extra inch or more per yard on some classes of goods may be allowed in shrinkage to balance the stretching of pieces passing through the various machines in finishing, but, in all cases, this may be easily ascertained by putting one piece through and finding by the yard measure what the piece actually stretches and weighs when finished. The greatest judgment and experience are required, so that the proper amount of weight is applied to shrink a piece in length in the same proportion that it shrinks in width so that it may come up in length and width both at the same time, as fabrics thus dealt with are less liable to draw out or stretch than if done otherwise. When a piece has been run a short time, it may be taken out and measured in length and width to see that it is fulling evenly, and to add some weight if necessary, or some soap, to keep it in perfect fulling condition, but a practical, efficient fuller can tell by the feel, without protracting the fulling by pulling it out more than once or so.

THE STARCHING AND SIZING OF COLORED COTTON GOODS.

After the cloth is dried and washed it is ready for the next processes of starching, drying, etc. If the cloth were dried directly, without being passed through some sizing substance, it would have a very flimsy feeling and would present a very poor appearance. So, before being dried, it is run through some substance, as starch paste, that will give a body and stiffness to the piece. There are many substances that can be used for this purpose, but starch is the one preeminently fitted for, as it is cheap, colorless and also gives a good body. Starch can be obtained from the various grain, from the potato and several other sources. That obtained from corn, wheat and potatoes is most used, and as corn starch is much the cheapest of the three it is the most used.

Chemically all the starches are the same, having the composition C_6, H_{10}, O_5, but they differ considerably in physical properties. Potato starch has much more stiffening power than that obtained from corn, but its price is enough higher to more than counterbalance this advantage. When examined under the microscope, starch is seen to consist of small globules, each of which has a minute kernel surrounded by concentric layers. These globules vary in size in the different starches; those from the potato being three times the diameter of those found in the wheat.

Practically we are not so much interested in the chemical composition or the source of the starch as we are in the results to be obtained by its practical use. But as the quality depends on its purity, we will briefly consider how it is obtained and what impurities are liable to be present that will exert an injurious effect. Starch is insoluble in cold water, and so by crushing the grain or potatoes, as the case may be, and washing with water, the starch granules can be floated off, mixed with gluten and other impurities. These impurities have to be removed, or the starch will ferment and sour very quickly.

There are two principal processes of purification, the acid and the alkali. The former is used for wheat and the latter for corn starch. After being purified, the starch is graded into several qualities differing in the amount of impurities present, the poorest containing the most gluten and fermenting much more quickly than the better qualities. Commercial starch usually contains 15 per cent. or more of water, as it readily absorbs the moisture from the air. The amount present can be very easily determined by weighing out a small sample and drying for several hours at 212° F. When heated with water to about 160° F. the starch granules swell and form a pasty mass. In order to make a quantity of the paste, the necessary amount of starch is well mixed with cold water and stirred until thoroughly pulverized, and it is then gradually heated to a boil, being kept well stirred all the time to prevent the formation of lumps. If the starch is of good quality, it will thicken gradually and boil up to a clear, transparent, gelatinous mass. The paste is made somewhat thicker than needed, and then diluted in the size-box to the consistency desired. A practical test of the comparative values of different samples of starch is very easily and cheaply made as follows:

Take as many glass beakers, or other suitable vessels, as you have samples to test. Weigh or measure out into each 10 oz. of water, and then weigh 1 oz. samples of the starches to be tested. Mix each sample thoroughly with the water in its respective beaker and set them all into a basin of water which can be heated to boiling, forming a water bath. Now gradually heat the water, keeping the samples well stirred, until all have gelatinized, and then remove them from the bath and allow to cool. The paste on cooling will form a quite solid jelly and any difference in the samples can be easily detected by pressing on the jelly with the fingers. The best sample forms the most solid jelly. Then, by letting them stand in a warm place and by noticing the time in which each sample sours, we can get a very good idea of the value of the different samples.

If the starch has been adulterated with gypsum, barytes, china clay or other heavy mineral, to add to its weight, this will easily be detected, as such adulterants fall to the bottom of the paste and are easily seen if glass beakers are used.

When a finisher desires to satisfy himself practically as to whether the wheat or potato starch is of good quality, let him proceed as follows:—Enter the water into the starch which is to serve as the finished mass. If the starch precipitates at once it contains much water. If it becomes cloudy, produces bubbles, foams or emits a bad odor, collects dirt, etc., it is not of a prime quality. The slower a starch divides in water the better it is. Another guide is offered—if the starch deposits in the finishing tub, for when in the vessel in which it is boiled, wheat starch must not precipitate upon the bottom as a firm mass. This indicates the presence of potato starch, or flour. The finisher must also notice its consistency in boiling.

The cloth comes to the starch room in a moist state and is in the best possible condition to receive the starch into the fibres. If, however, it is allowed to lie after dyeing until exposed places have become dry, it is very difficult to apply the starch uniformly; and so, as a rule, the pieces are starched as soon as possible after dyeing. In applying the starch to the cloth, there are several points to be observed:

1. The starch should be of good quality and the paste perfectly free from lumps.

2. The paste should be forced into the fibres of the cloth and not form a mere superficial layer.

3. It must be applied uniformly to all parts of the cloth and in a quantity dependent on the stiffness desired.

4. If any weighting material, as baryta, is added to the paste, it has a great tendency to settle to the bottom of the size tub, and great care must be used to keep it mixed uniformly throughout the paste.

In order to force the starch into the fibres, heavy pressure is necessary. In a starch mangle this is obtained by running the cloth through a series of rolls, which, besides squeezing out the surplus starch, also by their heavy pressure force the paste into the fibres. The heavy pressure also produces a smooth, hard surface, which in some classes

of goods is very desirable. Provided this smooth surface is not wanted on account of the character of the fabric under operation, the cloth is simply run between two small squeeze rolls, whose pressure can be regulated as desired.

There are two methods in use for starching the fabrics, viz: 1, starching both sides; 2, starching its back only, which procedure to use depending upon the nature and character of the fabric under operation.

(1) Starching Both Sides of the Fabric. For this work the machine, used consists either of two or three squeezing cylinders or bowls, through which the cloth to be treated is made to pass after it has been first impregnated with the size contained in a trough placed below the cylinders or bowls, previously referred to, and of which the lower cylinder or bowl is generally allowed to revolve in the size.

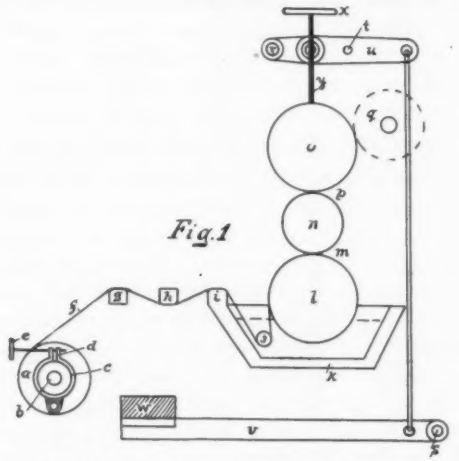


Fig. 1

Fig. 1 shows in section a starch mangle, specially adapted to three different methods of saturating cotton goods, viz: either with heavy, medium, or light starch or stiffening (of any character) during its transit through the machine.

(1). Heavy Filling. In connection with this style of starching or stiffening, the run of the cloth to be treated, through the machine is as follows: a indicates the reel of cloth as wound on a wooden roller, through the centre of which runs an iron square bar with round ends, b, for bearings, placed in brackets on each side of the machine. c indicates a flange on the wooden roller to which an easy tension is applied by means of brake, d, through tension wheel, e, connected with it. The cloth, f, as coming from the reel of cloth, a, is then threaded through three wooden tension rails, g, h, and i, and then under a brass roll, j, which is located in wooden starch box, k, below level of stiffening matter. From brass roll, j, the fabric then passes around the upper portion of bottom roll, l, and thus through first nip, m, then following in the same direction the rotation (superficially) of middle, n, and top roll, o (second nip, p). The cloth is then reeled automatically, by contact, to surface of top roll, q.

It will thus be seen at a glance, that by this arrangement of the cloth is assured of a thorough pregnation of starch matter, which occurs when entering the starch box, and is unrelieved by any protecting surface. By the two nips, m and p, the effect of laying the starch evenly on the starch is assured. Compound levers and weights are arranged in the machine so as to be able to apply any reasonable percentage of weight in nip on rolls desired, the construction observed being: r, s, fulcrums for compound levers; t, stud hole for dead set when required; u, top lever; v, bottom lever; w, weights; x, hand wheels; y, adjusting screws for regulating lift of compound levers.

(2). Medium filling of cotton goods is accomplished by avoiding use of brass roller, j, in the wooden starch box as a guide for the cloth, applying instead the cloth directly from wood tension rails, i, to the bottom roll, l, which is immersed in starch, and the cloth collect only that amount of starch that may occur from one side of the surface of cloth being exposed to treatment, and which the fibres of cloth would naturally carry while being conveyed, during its momentary rotation in the filling compound. The cloth is then subjected to the two nips, m and p, which perform the even distribution of starch desired for medium weight finish.

(3). Light filling of cotton goods is accomplished by avoiding the entrance of the cloth into the starch box at all, taking it direct from tension rails, i, through nip, m, in this manner applying to the cloth only

starch, or other filling compound, that the bottom roll, l, may collect during its rotation through starching composition in which it is immersed to about 1/3 its diameter, and which in this instance is relied upon to be sufficient, the two nips, m and p, rubbing-in this small percentage of starch or similar filling compound most evenly into the whole texture of the cloth.

Starching the Back of the Fabric Only. When the size is to be applied on one side (back) of the cloth only, then a different make of machine must be used, a specimen of which is shown in its section in Fig. 2.

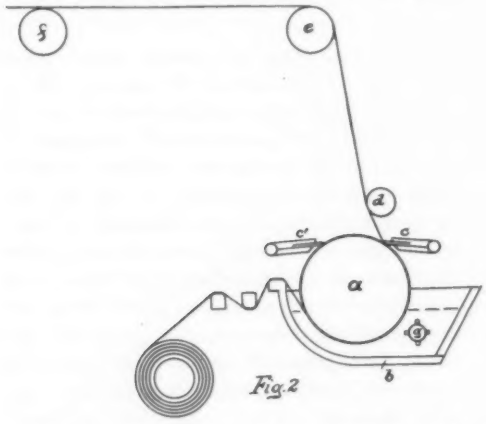


Fig. 2

This machine consists of a large roll, a, made of wood, or more preferably husk, cotton, or paper; the latter three materials being preferable to wood, on account of their greater durability in maintaining a clean and perfect surface. This roll is made to revolve, partly immersed, in a wooden tank, b, containing the starch or filling compound, as is to be applied to the back of the fabric under operation. Parallel with the surface of this roll, above the tank containing the filling composition, are two adjustable doctors or scrapper, c c^1, one on each side, which are made to traverse by means of a crank disc; one doctor to rest on face of roll on one side, and the other to rest on filled side of cloth on the other side. A brass roller, d, is arranged in a suitable position above the large roll, previously referred to, so as to apply a mild tension to the fabric, and guide it to overhead wood drums, e, f, which are placed at a sufficient altitude to clear the head of operator and convey cloth in turn either to a folder or dry cans. A wooden box for holding the filling composition, and in which the large roll previously referred to is immersed, and an agitating roll, g, made adjustable to keep starch from settling, completes the details of the machine.

In some mills, having less approved machinery only, the fabric in connection with the back filling mangle then used, simply passes, face up, through two rollers, or squeezers, the lower of which revolve into

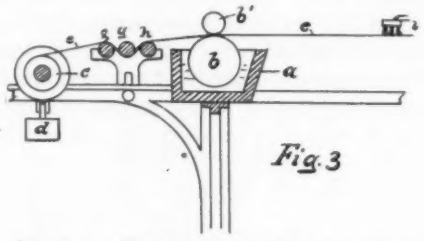


Fig. 3

the size, i. e., filling composition, as placed in a wooden trough. The composition is then also only applied to the back of the fabric, said application, however, being not as perfect, since, by the pressure as exerted upon the fabric, between the two rollers, the size, i. e., the filling composition is pressed into the cloth, and does not remain entirely on the back of the fabric as is the case with the back filling mangle previously described. The working of such a back filling mangle will be readily understood from illustration Fig. 3. The starch or filling compound is there deposited in the wooden trough, a, in which revolves partially immersed, a large roller, b. The reel of cloth to be starched, and as placed in suitable guides on the framework of the machine, is indicated by c, and friction weight by d. The cloth, e, as unwinding under proper tension from the reel of cloth, face up, in turn passes three wooden tension rolls, f, g and h, and from there between the nip of rolls, b, b^1, and where the size, as taken up by the roller, b, is applied to the back of the fabric, and by means of pressure of roller, b^1, upon roller b, pressed more or less, according to the amount of pressure given to roller b^1, into the back of the fabric; at the same time pressing out of the fabric any superfluous sizing compound. The pressure may be exerted upon roller b^1, either by

means of springs, weights or screws. In order to keep the size at proper temperature, steam pipes, suitably arranged in the trough, a, are supplied. After passing the nip, b b^1, the fabric is either automatically folded, or passed direct to the cylinder-drying machine, being previously—in some instances—subjected to the action of a brush, i.

AN INGENIOUS CENTRE SELVAGE FORMING ATTACHMENT.

This attachment has been lately patented by the Crompton & Knowles Loom Works, its construction and operation being readily seen from the accompanying illustrations. Fig. 1 is a sectional view of the selvage warp thread spool and crossing selvage warp thread spool and guide and the lay and two heddles, two selvage warp threads, and the crossing selvage warp thread, and the new centre selvage forming attachment combined therewith. Fig. 2 shows the formation for

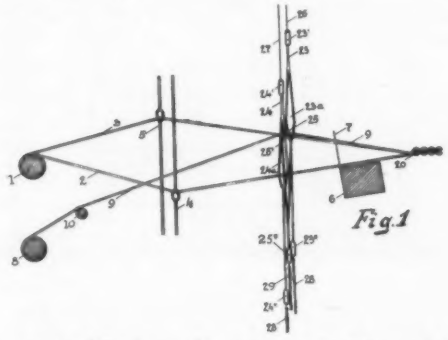


Fig. 1

the next pick, i. e., the reverse position of the heddles and the two selvage warp threads and the crossing selvage warp thread and the centre selvage forming attachment. Fig. 3 shows a detached section of a woven fabric having a centre selvage.

A description of the formation of the centre selvage is best given by quoting numerals of reference accompanying the illustrations, and of which 1 is a spool, over which the two selvage warp threads 2 and 3 lead. 4 and 5 are the heddles for operating warp threads 2 and 3 respectively. 6 is the lay, and 7 the reed.

8 is a spool over which the crossing selvage warp thread, 9, leads, in passing over a guide roll, 10. The crossing selvage warp thread, 9, on its way to the reed, 7, passes through an eye, 25, forming one part of the new centre selvage forming attachment, and forms the means for supporting the crossing selvage warp thread in its raised or lowered position. Two wires, 23 and 24, support the eye, 25, of the crossing selvage warp thread, 9, each of which is made of two strands of wire having loops, 23′ and 24′, at their upper

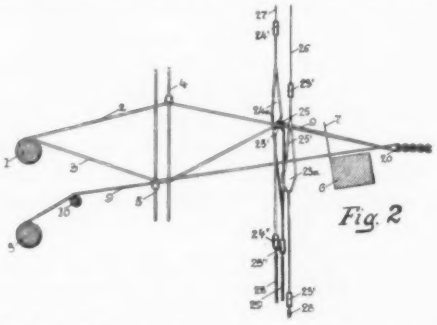


Fig. 2

ends for the cords or wires, 26 and 27, and also two loops, 23″ and 24″, at their lower ends for the spiral springs, 28. At the upper part of the wires, 23 and 24, the two strands of wire are spread apart to form eyes, 23a and 24a, to support the extensions, 25′, on the eye, 25, which extensions are connected together at their lower ends and have

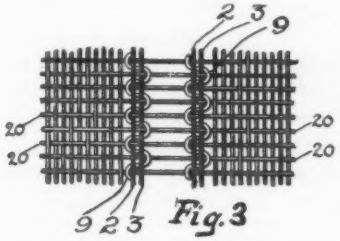


Fig. 3

a loop, 25″, thereon, to which is attached spring, 29.

THE OPERATION

of the new attachment is thus: Supposing everything is in the position shown in diagram Fig. 1 with the selvage warp thread, 3, between the extensions, 25′, on the eye, 25, and the cord, 27. Then the lowering of the heddle, 5, carries down the selvage warp thread, 3, and the simultaneous raising of the heddle, 4, raises the selvage warp thread, 2. The simultaneous lowering of the cord,

26, and wire, 23, allows the eye, 25, and the extensions, 25′, thereon and the crossing selvage warp thread, 9, to be lowered until the simultaneous raising of the cord, 27, and the wire, 24, thereon causes the loop, 24a, to engage the eye, 25, and check any further downward movement of said eye, 25, and thread, 9. This will happen when the selvage warp threads, 2 and 3, and the crossing selvage warp thread, 9, are about in the middle of the shed or in the same horizontal plane. The continued movement of the heddles, 4 and 5, to their extreme positions carries up the selvage warp thread, 3, and the continued movement of the cords or wires, 26 and 27, carries up the wire, 24, and with it the eye, 25, and thread, 9, and carries down the wire, 23. In the upward movement of the cord, 27, and wire, 24, the selvage warp thread, 2, is guided by the loop, 24a, as is also warp thread, 3, in its descent and carried over the top of the eye, 25, and to the other side of the crossing selvage thread, 9, as shown in Fig. 2. A pick, 20, is now inserted and beaten up.

The several parts are next again operated to change them from the position shown in Fig. 2 to the position shown in Fig. 1, with the warp threads, 2 and 3, on the other side of the eye, 25, and also the crossing selvage warp thread, 9, guided by the loop, 23a, on the cord, 26. A pick, 20, is again inserted and the operation repeated and a centre selvage, as shown in Fig. 3, formed in the fabric, a second similar attachment forming the other selvage. In place of using only two standard warp threads in the formation of the selvage more of them can be used.

A WARP DYEING INVENTION.

This construction of a dyeing machine refers more particularly to such as used for the dyeing of cotton warps, having for its object to keep the material to be dyed continuously submerged within the dye liquor, hence out of exposure to the atmosphere during the dyeing process which in connection with any number of dyestuffs is very injurious to the process.

In this machine the material passes through it in return and continuously repeated courses while immersed in the dye liquor until the requisite color or shade is obtained.

Of the accompanying illustrations, Fig. 1 shows this dyeing machine in its section, Figs. 2 and 3 being views in detail, showing plan views of guide plates as used respectively at the two ends of the machine.

The machine itself is removably suspended in a vat, 1, which in turn is provided with means (not shown) for heating the dye liquor, and consists of two frames, 2, properly connected together by side pieces, said skeleton framing being suspended within the vat, 1, by lugs, 3, so that it can be lifted out of the vat when so required. This frame, 2, carries top rollers, 4, 5, 6, and bottom rollers, 7, 8, 9, said rollers reaching across the machine, between the two side frames, 2, of the skeleton framing, all six rollers quoted being submerged below the top, 10, of the dye

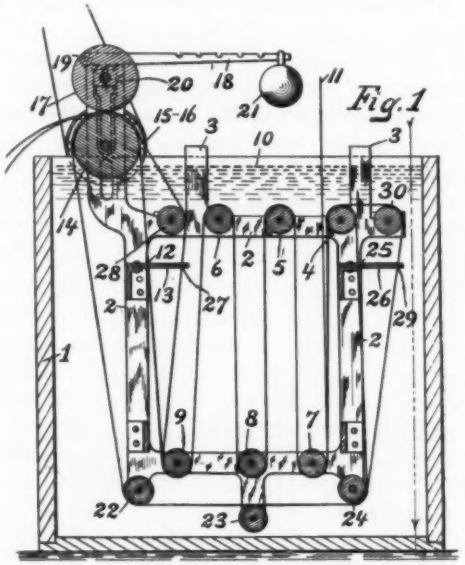


Fig. 1

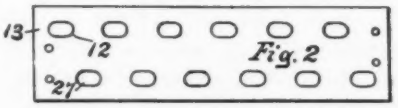


Fig. 2

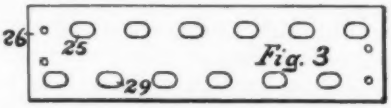


Fig. 3

liquor. The warp, 11, as shown, enters the machine from above, and is carried at first under roller, 7, up and over roller, 5, down and under roller, 8, up and over roller, 6, down and under roller, 9, thence through opening, 12, in porcelain guide plate, 13, to and between the driving roller, 14, which is provided with a tight pulley, 15, and a loose pulley, 16, and the pressure roller, 17, which is provided with levers, 18, fulcrumed at 19, bearing on boxes, 20, and carrying weights, 21.

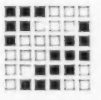
The warp after leaving the nip of rollers, 14 and 17, in turn is returned to the opposite end of the machine by passing down and under guide roller, 22, over carrier roller, 23, under guide roller, 24, up through opening, 25, in guide plate, 26, which deflects the material to one side, and thence over roller, 4, down to roller, 7, which completes one return circuit.

The next circuit from roller, 7, is parallel to the first one until passing roller, 9, when the material passes through opening, 27, in guide plate, 13, over roller, 28, between rollers, 14, 17, and onto guide plate, 26, through its opening, 29, to guide roller, 30, and rollers, 4, 7, thus completing the second return circuit, and so on continuously in as many parallel return circuits as are necessary for perfect results with the dye and material employed in the process. When dyeing warps, great care must be exercised to prevent their ends from becoming tangled and broken, hence spreading and separating the material at one end of the machine by means of the rollers, 24, 30, and guide plate, 26, and at the opposite end by means of roller, 9, guide roller, 28, and guide plate, 13, will prevent this trouble.

It will also be observed, that at each end of the machine, each alternate course of the material is separated and guided in parallel alignment by being passed through the offset openings, 12, 27, at one end of the machine and openings, 25, 29, at the other end of the machine, and so on in continuous succession until the process is completed, when the material finally passes from the machine between rolls, 14, 17, at A, to enter the wash tank (not shown). The number of warps run at once and the number of return circuits made by each warp can be varied to suit needed conditions or the capacity of the machine. Strings of fabrics can be treated similarly.

NOVELTIES FROM FOREIGN SOURCES.

Diagonal Suiting.



Complete Weave.

Repeat 6×6.

Warp:—4650 ends, 12 harness straight draw.

Reed:—18×4=65 inches wide.

Dress:—

3 ends, 2/45's worsted, black	=	3 ends.
1 end, 2/45's worsted, light and dark gray 1 end, 2/45's worsted, black	×22=	44 ends.
1 end, 2/45's worsted, light and dark gray	=	1 end.
Repeat of pattern:		48 ends.

Filling:—66 picks per inch, arranged thus:

3 picks, 2/30's worsted, black	=	3 picks.
1 pick, 2/30's worsted, light and dark gray 1 pick, 2/30's worsted, black	× 25=	50 picks.
1 pick, 2/30's worsted, light and dark gray	=	1 pick.
Repeat of pattern:		54 picks.

Finish:—Worsted finish, 56 inches wide.

Fancy Cassimere.

Complete Weave. Repeat 4×4.

Warp:—2755 ends, 8 or 12 harness fancy draw.

Reed:—10×4=69 inches wide in loom.

Dress:—

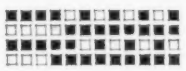
5 ends, 3 run woolen yarn, light gray	=	5 ends.
5 ends, 3 run woolen yarn, black	=	5 ends.
Repeat of pattern:		10 ends.

Filling:—44 picks per inch, arranged thus:

1 pick, 3¼ run woolen yarn, medium gray 1 pick, 3 run woolen yarn, black	×2	= 4 picks.
1 pick, 3¼ run woolen yarn, medium gray	=	1 pick.
7 picks, 3 run woolen yarn, black	=	7 picks.
Repeat of pattern:		12 picks.

Finish:—Melton finish, 56 inches wide.

Fancy Cassimere (Trousering).



Complete Weave.

Repeat 12×4.

Warp:—3570 ends, 4 run woolen yarn, black.

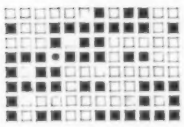
Reed:—13×4=70 inches wide in loom.

Filling:—44 picks per inch, arranged thus:

1 pick, 3 fold woolen yarn, viz: 4 run black, 4 run slate, and 4 run pearl, 2 turns per inch.
1 pick, 4 run woolen yarn, black.

Finish:—Velvet finish, 56 inches wide.

Worsted Trousering.



Complete Weave.

Repeat 12×8.

Warp: 9540 ends, 12 harness straight draw.

Reed:—23½×6=67 inches wide in loom.

Dress:—

1 end, 2/64's worsted, black, twisted with 300/2's silk, white.	×2=	6 ends.
1 end, 2/64's worsted, black and white.		
1 end, 2/64's worsted, black and gray.		
2 ends, 2/64's worsted, black	×2=	6 ends.
1 end, 2/64's worsted, black and gray		
2 ends, 2/64's worsted, green	=	2 ends.
1 end, 2/64's worsted, black and gray	=	1 end.
2 ends, 2/64's worsted, black	=	2 ends.
1 end, 2/64's worsted, black and gray	=	1 end.
1 end, 2/64's worsted, black, twisted with 300/2's silk, white	×2=	6 ends.
1 end, 2/64's worsted, black and white.		
1 end, 2/64's worsted, black and gray		
2 ends, 2/64's worsted, black	=	2 ends.
7 ends, 2/64's worsted, black and gray	=	7 ends.
2 ends, 2/64's worsted, black	=	2 ends.
10 ends, 2/64's worsted, black and gray	=	10 ends.
2 ends, 2/64's worsted, black	×3=	9 ends.
1 end, 2/64's worsted, black and gray		
1 end, 2/64's worsted, black, twisted with 300/2's silk, white	=	1 end.
1 end, 2/64's worsted, black and white	=	1 end.
4 ends, 2/64's worsted, black and gray	=	4 ends.
1 end, 2/64's worsted, black, twisted with 300/2's silk, white	=	1 end.
1 end, 2/64's worsted, black and white	=	1 end.
1 end, 2/64's worsted, black and gray	=	1 end.
2 ends, 2/64's worsted, black	×3=	9 ends.
1 end, 2/64's worsted, black and gray		
9 ends, 2/64's worsted, black and gray	=	9 ends.
2 ends, 2/64's worsted, black	=	2 ends.
7 ends, 2/64's worsted, black and gray	=	7 ends.
2 ends, 2/64's worsted, black	=	2 ends.
1 end, 2/64's worsted, black and gray	=	1 end.
1 end, 2/64's worsted, black, twisted with 300/2's silk, white	×2=	6 ends.
1 end, 2/64's worsted, black and white		
1 end, 2/64's worsted, black and gray		
2 ends, 2/64's worsted, black	×2=	6 ends.
1 end, 2/64's worsted, black and gray		
2 ends, 2/64's worsted, orange	=	2 ends.
1 end, 2/64's worsted, black and gray	=	1 end.
2 ends, 2/64's worsted, black	=	2 ends.
1 end, 2/64's worsted, black and gray	=	1 end.
1 end, 2/64's worsted, black, twisted with 300/2's silk, white	×2=	6 ends.
1 end, 2/64's worsted, black and white		
1 end, 2/64's worsted, black		
2 ends, 2/61's worsted, black	=	2 ends.
7 ends, 2/61's worsted, black and gray	=	7 ends.
2 ends, 2/64's worsted, black	=	2 ends.
10 ends, 2/64's worsted, black and gray	=	10 ends
2 ends, 2/64's worsted, black	×3=	9 ends.
1 end, 2/64's worsted, black and gray		
1 end, 2/64's worsted, black, twisted with 300/2's silk, white	=	1 end.
1 end, 2/64's worsted, black and white	=	1 end
4 ends, 2/64's worsted, black and gray	=	4 ends.
1 end, 2/64's worsted, black, twisted with 300/2's silk, white	=	1 end.
1 end, 2/64's worsted, black and white	=	1 end
1 end, 2/64's worsted, black and gray	=	1 end.
2 ends, 2/64's worsted, black	×3=	9 ends.
1 end, 2/64's worsted, black and gray		
9 ends, 2/64's worsted, black and gray	=	9 ends.
2 ends, 2/64's worsted, black	=	2 ends.
7 ends, 2/64's worsted, black and gray	=	7 ends.
2 ends, 2/64's worsted black	=	2 ends.
1 end, 2/64's worsted, black and gray	=	1 end.

Repeat of pattern: 186 ends.

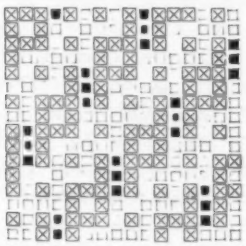
Filling:—110 picks per inch, arranged thus:

1 pick.
1 pick, 2/64's worsted, black.

2 picks. Repeat of pattern.

Finish:—Worsted finish, 56 inches wide.

Worsted Suiting.



Complete Weave.

Repeat 16×16.

Warp:—5600 ends, 16 harness fancy draw.

Reed:—22×4=63 inches wide.

Dress:—

2 ends, 2/52's worsted black, twisted with 120/2's pearl mercerized cotton	=	2 ends.
4 ends, 2/40's worsted, black	=	4 ends.
2 ends, 2/64's worsted, black and slate, twisted with 2/64's worsted, black	×2=	8 ends.
2 ends, 2/40's worsted, black.		
2 ends, 2/40's worsted, black and dark gray	×2=	8 ends.
2 ends, 2/40's worsted, black.		
2 ends, 2/64's worsted, black and slate, twisted with 2/64's worsted, black	×2=	8 ends.
2 ends, 2/40's worsted, black.		
2 ends, 2/40's worsted, black	=	2 ends.

Repeat of pattern: 32 ends.

Filling:—86 picks per inch, arranged thus:

2 picks, 2/52's worsted, black, twisted with 120's pearl mercerized cotton	=	2 picks.
1 pick, 2/40's worsted, black.	×2=	4 picks.
1 pick, 5 run woolen yarn, black.		
1 pick, 2/64's worsted, black and slate, twisted with 2/64's worsted, black	×2=	8 picks.
1 pick, 5 run woolen yarn, black.		
1 pick, 2/40's worsted, black.		
1 pick, 5 run woolen yarn, black.		
1 pick, 2/40's worsted, black and dark gray		
1 pick, 5 run woolen yarn, black.		
1 pick, 2/40's worsted, black.	×2=	8 picks.
1 pick, 5 run woolen yarn, black.		
1 pick, 2/64's worsted, black and slate, twisted with 2/64's worsted, black.		
1 pick, 5 run woolen yarn, black.	×2=	8 picks.
1 pick, 2/40's worsted, black.		
1 pick, 5 run woolen yarn, black.		
1 pick, 2/40's worsted, black	=	1 pick.
1 pick, 5 run woolen yarn, black.	=	1 pick.

Repeat of pattern: 32 picks.

Finish:—Worsted finish, 56 inches wide.

Diagonal Suiting.

Complete Weave.

Repeat 6×6.

Warp:—4356 ends.

Reed:—22×3=66 inches wide in loom.

Dress:—

3 ends, 2/42's worsted, black.	=	3 ends.
1 end, 2/42's worsted, light and dark gray	×22=	44 ends.
1 end, 2/42's worsted, black.		
1 end, 2/42's worsted, black.	=	1 end.

Repeat of pattern: 48 ends.

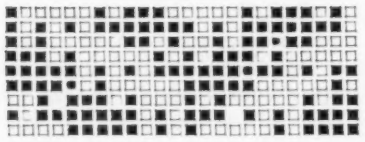
Filling:—64 picks per inch, arranged thus:

3 picks, 2/28's worsted, black.	=	3 picks.
1 pick, 2/28's worsted, light and dark gray.	× 25=	50 picks.
1 pick, 2/30's worsted, black.		
1 pick, 2/30's worsted, black.	=	1 pick.

Repeat of pattern: 54 picks.

Finish:—Worsted finish, 56 inches wide.

Overcoating.



Complete Weave. Repeat 24×9.

Warp:—5390 ends, all 6 run green drab and 7 run white woolen yarn twist.

Reed:—19×4=71 inches wide in loom.

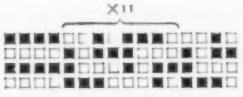
Filling:—100 picks per inch, arranged thus:

2 picks, 5½ run woolen yarn, brown olive.
1 pick, 3½ run " " " "

3 picks. Repeat of pattern.

Finish:—Full, scour. gig. shear some, press steam lustre, press, steam; 56 inches finished width.

Worsted Trousering.



Complete Weave.

Repeat 96×4.

Warp:—5365 ends, 10 harness fancy draw.

Reed—19½×4=68½ inches wide in loom.

Dress:—

4 ends, 2/26's worsted, black	=	4 ends.
2 ends, 1/26's worsted, black, and 2/52's worsted, gray	×6=	24 ends.
2 ends, 2/32's worsted, dark gray		
2 ends, 1/26's worsted, black, and 2/52's worsted, gray	=	2 ends.
4 ends, 2/26's worsted, black	=	4 ends.
2 ends, 1/26's worsted, black, and 2/52's worsted, gray	=	2 ends.
4 ends, 2/32's worsted, dark gray	=	4 ends.
2 ends, 2/32's worsted, light gray	=	2 ends.
4 ends, 2/32's worsted, dark gray	=	4 ends.
2 ends, 1/26's worsted, black, and 2/52's worsted, gray	=	2 ends.
4 ends, 2/26's worsted, black	=	4 ends.
2 ends, 1/26's worsted, black, and 2/52's worsted, gray	×6=	24 ends.
2 ends, 2/32's worsted, dark gray		
2 ends, 1/26's worsted, black, and 2/52's worsted, gray	=	2 ends.
4 ends, 2/26's worsted, black	=	4 ends.
2 ends, 2/32's worsted, light gray	=	2 ends.
2 ends, 2/32's worsted, dark gray	=	2 ends.
6 ends, 2/32's worsted, black and dark gray	=	6 ends.
2 ends, 2/32's worsted, dark gray	=	2 ends.
2 ends, 2/32's worsted, light gray	=	2 ends.
Repeat of pattern:		96 ends.

Filling:—60 picks per inch, all 2/26's worsted, black.

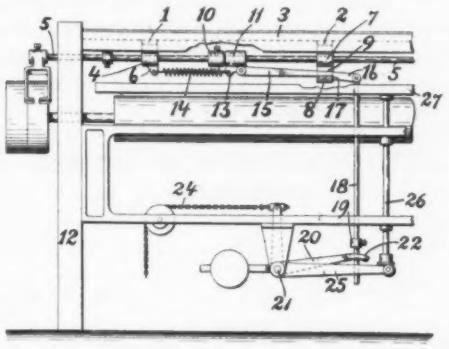
Finish:—Worsted finish, 56 inches wide.

STOP-MOTION FOR RING-SPINNING FRAMES.

The object of this motion is to prevent any waste of material as well as loss in time to the operator by automatically stopping the spinning-frame when its builder-motion has built the threads on the bobbins to the required height, this being accomplished by the stop motion being operated indirectly by the builder-motion to throw the belt-shipper of the machine from the tight to the loose pulley. It must be also mentioned that this stop-motion can be adjusted to suit different heights of bobbins.

The accompanying illustration is a front view of that portion of a ring spinning frame necessary to be given to show the construction, application and operation of this stop-motion.

In applying this stop-motion, cross-struts, 1 and 2, are secured to the top rail, 3, of the spinning frame. Strut, 1, has the bearing, 4, for the shipper-rod, 5, and the lug, 6, whereas strut, 2, has the bearing, 7, for the shipper-rod and the lower extension, 8, in which is an opening, 9. A fixed collar, 10, is adjustably secured to the shipper-rod, 5, by a set-bolt. A sliding collar, 11, is supported on the shipper-rod intermediate the fixed



collar, 10, and the strut, 2, adjacent the fixed collar, and has a lug, 13, connected to the lug, 6, by spring, 14. Arm, 15, is pivotally secured to the lug, 13, on the sliding collar, 11, and extends through the opening, 9, in the lower extension of the bearing, 7. The free end, 16, of this arm, 15, has the notch, 17, adapted to engage with the lower edge of the opening, 9, in the extension, 8, and hold the sliding collar, 11, in its normal position against the tension of the coiled spring, 14.

A vertical rod, 18, is pivotally secured at its upper end to the free end of the arm, 15, and has on its lower end a stop, 19, which is adjustably secured to the rod by a set-bolt. Lever, 20, is secured to rock-shaft, 21, by a bolt, and has in its free end, 22, slot, 23, through which the lower end of the vertical rod, 18, extends, with the stop, 19, above the free end of the lever, 20.

The operation of this stop-motion is thus: First adjust the stop, 19, on the vertical rod, 18, for the height of bobbins used. (The rock-shaft, 21, is operated through the chain, 24, by the builder-motion in the usual way. The lever, 20, moves in unison with the lifter-arm, 25, the lifting rod, 26, and the ring- rail, 27.)

When the yarn is built on the bobbins to the required height, the free end, 22, of the lever, 20, engages with the stop, 19, and lifts the rod, 18, and the free end of the arm, 15, and raises the notch, 17, out of engagement with the lower edge of the opening, 9. The sliding collar, 11, by the tension of the spring, 14, engages with the fixed collar, 10, on the shipper-rod and moves the shipper from the fast to the loose pulley and thus stops the machine.

The operation of starting the spinning-frame by moving the belt onto the fast pulley, in the usual way moves the parts of the stop-motion back into their normal or operative position.

PRACTICAL POINTS ON WOOLEN CARDING.

II.

THE TORRANCE BANK CREEL FOR WOOLEN CARDS.

This creel is used to hold the spools, as filled with sliver from the Torrance automatic balling machine, as explained in a former issue of the Textile World Record, when said slivers are to be fed to the next woolen card in the set. The construction of the creel is such as to prevent the obstruction of the spools in the creels, as is the case in connection with other creels.

It is a common occurrence in the employment of said bank-creels for the flying wool from the traveling sliver to accumulate upon the upright dividing rods, which separate the spools, as they revolve upon the horizontal rollers of the creels. These dividing rods are ordinarily round in cross section, and because of such shape the wool settling upon encircles said rods, when acted upon by the rolling spools, twisting and forming itself into rope-like bodies, which, grasping said dividing rods and entering between the said dividing rods and the spools, clog the latter, so that they are not free to revolve, but produce a drag upon the sliver, and thus the latter frequently breaks under the tension, causing considerable delay in remedying the trouble and unevenness in the yarn, should break not be discovered. The spool, because of the twisting of the loose wool and its clogging effect, is also frequently drawn from its seat upon and between the rollers, and fallen upon the adjacent machine.

It has been found that by making the dividing rod oval in cross section, the tendency of the wool flyings, as settling around the rods, to twist and form the rope-like body has been materially lessened, and as a result the objection from this source has been practically eliminated, thus enabling the creel to regularly supply the slivers to carding machine and produce a more perfect and uniform yarn.

The details of the creel are best shown by means of the accompanying illustrations, of which Fig. 1 is a front view of the creel, and Fig. 2 is a side view taken in the line, x, of Fig. 1.

Referring to the illustrations, a a indicate the side uprights of the frame, b are transverse bars for holding said side bars in proper relative position.

c c are horizontal rollers on which the spools are placed to give them rotary movement.

d are gear-wheels connected with a common source of power f, for giving rotary movement to said horizontal rollers, and g g are the vertical dividing-bars which separate the spools. Said rods extend up between the rollers and separate the spools of the several horizontal series from one another. Said vertical dividing rods are made oval in the cross-section, as mentioned, to prevent the wool from circling the same and twisting to form the clogging rope. h indicates the bottom rail, on which the said vertical dividing-rods are seated and held up from the floor.

i is a false or shell rail, held up from the bottom rail by feet or lugs j. Said shell-rail is perforated to receive the dividing-rods and hold the same from lateral movement.

The rolls, thus being positively driven, produce a positive unwinding of the slivers to the back of the card to which they are fed.

THE APPERLY FEEDER.

This feeder is used either by itself or in connection with what is known as the "Kemp Traveler." Many carders think that the "Standard Apperly" accomplishes just as good results, and we know of any number of mills which consider the "Kemp Traveler" with its positively driven rolls a great improvement, because it lays the silver down on the feed table of the Apperly feed without any strain, so that the sliver comes in between the feed rolls evenly, and thus prevents fine ends.

The object of the Apperly feeder is to make the delivery of the sliver from the second breaker of a woolen set, and the feeding of said silver to the finisher card, a continuous operation, to be performed automatically; said sliver having to be fed in such a manner as to produce an even and uniform feed across the whole working width of the card. In some instances this feed is also used between the first and second breaker carding engine, besides being used between second breaker and finisher, the feeding in this instance being a continuous operation between first breaker and finisher.

To accomplish the even and uniform feeding previously referred to, the delivered sliver has to be laid diagonally back and forth across the width of the card on the feed table, thus making a continuous layer of sliver which then corresponds to a regular lap, except that the fibres are presented to the licker-in at an angle instead of in the direction of their length

The machine consists principally of a delivering mechanism for the preceding card, and a mechanism for laying the continuously delivered sliver diagonally on the feed table of the succeeding card. The delivering mechanism consists of a trumpet and pair of calender or delivery rolls, situated at the side of the front end of the card, and by which the film of carded wool is condensed and passed from the card. It is then guided upwardly to an overhead guide pulley, then to a similar one, suitably located, so that the sliver in passing from it is in a convenient position to be fed through the laying mechanism. As will be readily understood, this laying mechanism or traveler constitutes the principal part of the feeder, and its construction and operation are best shown by means of the accompanying illustrations, of which Fig. 3 is a top view of the laying mechanism, showing also the disposition of the sliver on the feed table of the card, and Fig. 4 is a perspective view of two feed rolls of different external diameter.

It will be seen that the mechanism is placed diagonally to the feed table, and consequently the travel of the carrier back and forth across the table will be at the same angle. The carrier has a pair of feed rolls provided on it which are driven by the movement of said carrier back and forth, the sliver in this manner being positively laid on the table, rather than simply guided, which requires a gripping device for the sliver on the table to hold the sliver in place.

Referring to the illustrations for the details of the mechanism, Fig. 1 indicates the carrier or traveler, which travels back and forth on the guide rod 2, said carrier being actuated through the chain 3, which passes around the sprockets 4 and 5, the latter being positively driven through the gearing shown. The feed table consists of a number of endless aprons 6, which travel slowly towards the licker-in of the card, taking the diagonally placed sliver along with them to be fed to the card.

The carrier or traveler is the principal part of the mechanism, and consists essentially of a rocking plate 7, carrying a pair of gears 8 and 9, which are in mesh with each other and one of which is always in contact with a stationary rack 10 of the mechanism. On the same studs with the respective gears 8 and 9 are the feed rolls of the carrier, between which the sliver passes to the feed table. From the fact that one of the gears is in contact with the rack and the two gears are in mesh with each other, when the carrier is moved by the traveling chain 3, the gears will receive a rotation, and consequently the feed rolls will also receive a similar rotation. In order that these feed rolls will always revolve in the

same direction, whether the carrier is moving in one direction or the other, at the end of each traverse of the carrier, the rocking plate is moved, so that the gear which is in contact with the rack will be moved out of contact, and the other gear thrown in, in this manner the reverse direction of travel not changing the direction of rotation of the feed rolls.

It is very important to have the feed rolls feed the sliver correctly under all conditions, and in some cases different diameter of rolls are necessary in order to meet the requirements of the sliver. To provide a convenient way of changing these rolls, hubs are provided and different outside diameter rolls as shown in Fig. 2 can be easily attached to them.

The studs carrying the gears are pressed toward each other by means of springs, and, therefore, they immediately adapt themselves to any change made in the diameter of the feed rolls. The rocking plate 7 is kept in one position during a traverse in either direction by means of a retaining spring 11.

Among the advantages claimed for this feeder are:

An improved sliver, in turn resulting in a more even and stronger roving and yarn.

An increase of production, and saving of labor in the card-room.

Waste in the card-room, as well as in the spinning-room, is reduced to a minimum, since all side-drawing waste between the cards is prevented, as well as that from the creels and at the spooler.

The "kemp" traveler lays the stock down on the table of the feed without strain, and so it goes to the feed rolls so evenly that fine ends are avoided.

There is as a rule a saving of space effected in the use of this "feeder," and the card-room will be lighter, and improved in appearance.

A NOVEL SELF THREADING SHUTTLE.

Among its advantages we find:

(1) Self threading,

(2) Preventing unthreading, and

(3) Guarding the thread while in the shuttle.

Of the accompanying illustrations Fig. 1 represents a top or plan view of a portion of the new loom shuttle, and Fig. 2 represents a perspective view of the threading device removed from the shuttle.

The operation of the shuttle is thus: The yarn is drawn from the bobbin through the passage, Q, and is guided by the arm, G, into the cavity, F, along one side of the tongue, E, and under an inclined wall of said cavity, F, whereby the yarn is caused to descend. Then the yarn is bent or turned over the end of tongue, E, when, as the draft continues, said yarn rides down the edge, H, of said tongue and the plate, A, and is directed

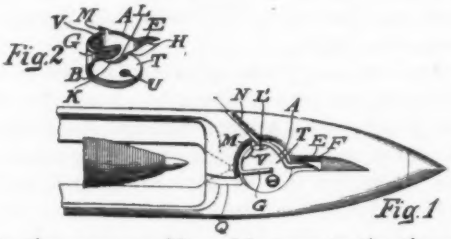


Fig. 2 Fig. 1

into the passage, N, and in turn to the thread eye of the shuttle.

It will be noticed that when the yarn enters the passage, N, the finger, M, prevents the yarn from running around the plate, A, back to the passage, Q.

Should there be any back draft of the yarn owing to the hook, K, it is prevented from returning upwardly along the edge, H, and thus unthreading of the shuttle is prevented.

At the sides of the outer terminal of the thread eye are two vertically extending posts, on which the yarn runs in its eduction from the shuttle, one of the posts being considerably removed from the terminal of the thread passage, N, which is in communication with the terminal of the thread eye, so that said post is beneath the wall of the nose of the shuttle, so that the under side of said wall forms a horizontal shoulder which prevents the yarn from rising above said shoulder and directly re-entering the passage, N, thus assisting in preventing the unthreading of the shuttle.

In order to strengthen the plate, A, and base, B, there is superimposed upon said base the plate, T, which has an opening, U, therein coincident with an opening in said base, B, thus strengthening the latter, and a recess, L, coincident with the recess, L.

CORRESPONDENCE AND NOTES

Upon Textile Topics at Home and Abroad.

A NOVEL LENO EFFECT.

BY JOSEPH HARGREAVES.

A close study of the cloth shown at Fig. 1 will reveal a combination of effects of a very complex character. To the uninitiated and casual observer it may appear much like any other leno or lace effect, and its real character becomes apparent only when the production of it is attempted. Although we have made great progress with the power loom, yet there are effects in which the hand loom still holds sway. The cloth under review is an instance in which the hand loom can hold its own. Less elaborate effects of the kind have been made on the power loom. During the last quarter of a century these peculiar fabrics have been on the market, but the production has been very slow and limited. Only those manufacturers who are determined to lead and be in the front rank of the art make an attempt at this class of product.

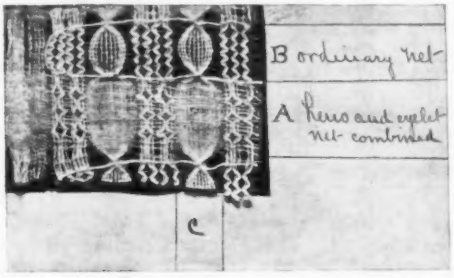


FIG. 1.

Fig. 1 illustrates the pattern, A is a leno and net effect combined. The warp threads under the eyelet net form a 3-and-3 leno, that is 3 picks in the open shed and 3 picks in the cross shed.

B is a pick and pick net; one pick in the open shed and one pick in the cross shed. The warp threads which are working leno in A are simply acting as ordinary standard or ground threads for B. Thus we have two kinds of net and a leno effect produced from the same warp threads.

C is a plain effect and a leno effect alternating lengthwise of the piece, but the striking feature is the drawing together or bunching of the warp threads at the division point of each. To hold these bunched threads together a box loom has been brought into use in order that a thick pick of filling, sufficiently strong to hold the crossing warp threads in position, may be inserted. In this particular pattern one thick pick is inserted for a binder, requiring a pick and pick loom. Three warps are required, one net warp, one warp for the leno under the net, and the centre threads. 16 warp threads in the effect marked C, and one for the 24 ends which are drawn together, also four sets of doups are required (see Figs. 2 and 3.)

G, for leno under the net.

H, for net effect.

I, for leno in effect marked C.

J, for crossing the threads to form the bunching effect.

In the construction of leno it is essential that the warp threads which cross over

each other must be in the same dent or split of the reed. If an effect is produced which violates this principle, then something out of

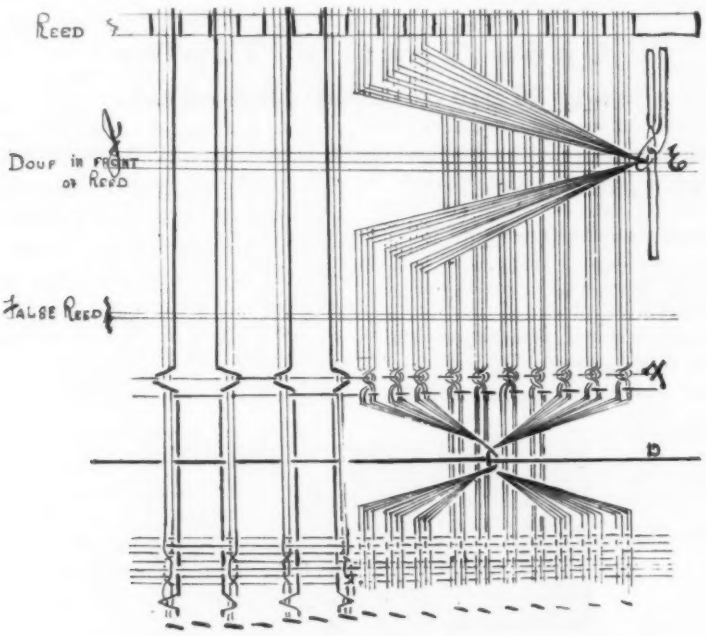


FIG. 2.

the ordinary method has been adopted. This is what has taken place in connection with the cloth under consideration. Observe that

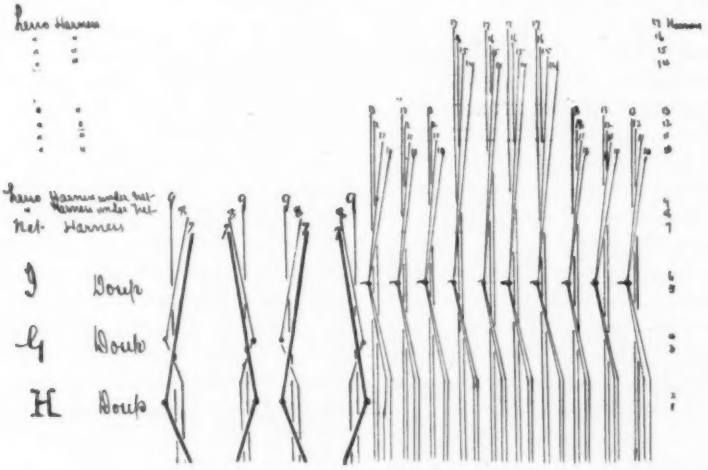


FIG. 3.

in effect C there are 40 warp threads, the outside 12 on the left crossing over the outside 12 on the right. The 16 threads in the centre are down and out of use during this crossing process. If these 40 warp threads were in one dent, the congestion would make it impracticable. In order to overcome this difficulty we must adjust the J-doup in front of the reed. There have been other methods used in the hand loom, but in the power loom the doup in front of the reed is adopted. This is accomplished by fixing the doup be-

tween a false reed and the reed which beats up the pick. The warp threads are placed in their proper position according to the effects required; this false reed has a rising and falling motion. It rises into position far enough to guide the shuttle across the loom, after which it falls below the race of the lathe so that it will not come in contact with the fell of the cloth as the lathe comes to the front centre to beat up the pick with the reed provided for that purpose.

doup, respectively, being operated by the dobby, according to path required, the device for connecting the doup in front of the reed to the dobby can be such as suits the convenience of the case.

In studying the pegging plan, Fig. 4, let it be understood that when the dobby rises, the doup in front of the reed is drawn down. This is because the dobby connections are working around pulleys underneath the loom. Thus when the jack in the dobby rises it must

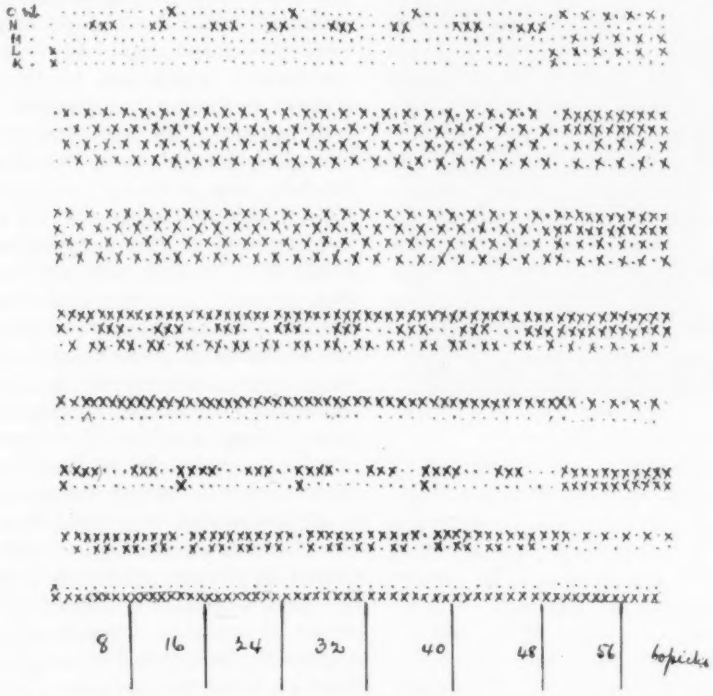


FIG. 4. K and L, vibrators for the bunching threads. M, vibrator for the leno which does not go through the front doup, E. N, vibrator for leno under the net. C, vibrator for net.

The principal reed is placed in brackets far enough behind the false reed to allow for the proper working of the doup. The brackets which hold the reed are projected from the lathe swords or any other convenient part of the lathe. These brackets can also be used for the doup by the fixing grooves to carry and steady the frame which holds the doup. The standard of the doup and the half doup are fixed in frames. It will be apparent that this doup swings with the lathe and is carried to the fell of the cloth at each pick. The up and down motion of the standard and half of necessity pull down the frame holding the doup. The rising of the doup when released by the sinking of the jack is accomplished by means of springs. The half doup in front of the reed will be down every pick, because when the bunching effect is being made the full doup is down; and at each of the other picks which intervene there are always some of the threads down which the half doup envelops.

K and L, each shows the vibrator for half of the bunching threads. M is the vibrator for the leno which does not go through the

front doup, E. The vibrator for the leno under the net is shown at N, while O is the vibrator for the net.

The best dobby for making this kind of fabric is what is known as the leno dobby, the workings of which causes the shed to close each pick and to open out in a V-shape when the shed is fully open. Figs. 2 and 3 illustrate the draft. D represents the thick filling requiring a box loom; E represents the doup crosing the warp threads to effect the bunching. Two vibrators are required for these 12 crossing ends. These two slacken the ends on the pick shown at D, and one of them when the leno is being made in picks, marked F. Another vibrator is required for the other leno threads shown at F. One vibrator is required for the net, and one vibrator for the leno under the net, 19 dent reed, warp yarn 40's, net yarn 3/16's, filling 60's and 3/16's for the binder picks. The number of picks varies. The plain effect in C, Fig. 1, is made with 72 picks; and the leno, with only 20 picks per inch.

ENGLISH NOTES.

(By Our Special Correspondent.)

A slight appreciation in merinos is one of the portents of the wool market, accompanied by a halt in crossbreds. To establish values soundly it is necessary that some of the disparity should disappear and the change adds new interest to the position of both grades. Thus far, consumers have scarcely shown the enthusiasm predicted before the year end. It is said, however, that German yarn buyers, who are among the most powerful bears of Yorkshire values, are growing more convinced of the firmness of sellers.

The help of further orders for Japan is relied on to maintain the price of coarse materials. Semi-official assurances have been given that the Japanese army is to be kept on a war footing for three or four years to come. Before orders from that source decline, it is permissible to think that the suspended animation of South Africa will be revived and there are symptoms, too, of improvement in domestic business generally.

Protesting voices are being raised against the alarming prevalence of threads of vegetable fibre in wool, and ways are being considered to get rid of the nuisance. The keenest eyesight fails to detect these undesirable visitors until the material has been dyed, when they become conspicuous enough. Opinion agrees that the threads have one of two origins Either they come from the bagging cloth, as with import wool, or from the use of abominable binder-twine for tying fleeces, as is the case with English wools. The trouble has increased and is the source of untold expense in burling in England. Bradford means to diminish the pest, and meetings of wool dealers and users have drawn up recommendations which are to be formally addressed to sundry associations, brokers and departments. One bold idea was to have all bale-cloth dyed black so that the color should proclaim the presence of foreign material. Against this it is urged that the dye might injure the wool. Other suggestions include the lining of bales with thin cotton wrappers or with paper. The worst said against these proposals is that they are expensive, and that any additional expense must be supported by wool-buyers and not by growers. Indeed, there was a conflict of opinion as to whether paper linings would cost one penny or two pennies per bale. If the benefit of the added protection is not worth twopence a bale it is to be feared that unscrupulous exaggerators have been dealing with the harm said to be caused by threads of hemp in the material. It would seem that reckless slashing of bale-covers by samplers in the dock warehouses is responsible for much of the trouble. Wool is dragged from the package over the jagged edges and then thrust again under cover with all the additions it has gained. A little care would obviate such occurrences and doubtless there are ways to persuade farmers to abandon the use of binder-twine.

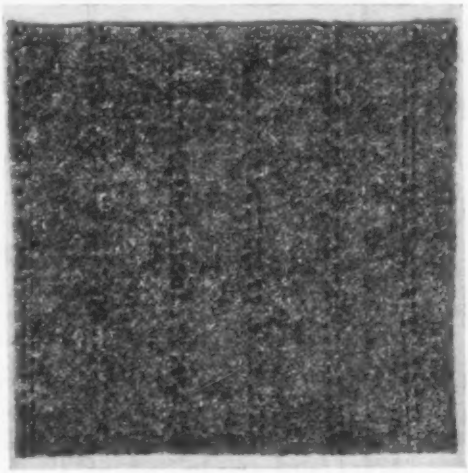
A proposition made public by the top makers, F. Willey & Co., has an importance of its own to all the world of wool users. It is asked that the principle of "differences" should be introduced, to a limited extent, into the Bradford business in combed wool. Thus, a tender of tops being held to vary from the standard sample, it would become competent to refer the sample to experts who may award

either a credit or a debit, as the case demands. With this allowance the buyer would be compelled to accept delivery.

The excuse for the suggestion is that commission houses are unreasonable enough to decline tenders which would be acceptable by a practical spinner. There may be justification for complaint against buyers for export, but Bradford looks with a jealous eye on a proposal which is regarded as the thin end of a formidable wedge. Old-fashioned traders have always striven to keep gamblers and non-experts out of the business. Once admit differential allowances, say they, and wool will become the prey of cornering capitalists as are cotton and wheat. The market knows how to deal with speculators who must deliver—not tops merely, but—tops of minutely specified quality. It fears the advent of bold outsiders who seek to smooth away all natural difficulties by payments of money. At various times obstacles against interlopers have been erected and it is not to be expected that Messrs. Willey's suggestions will be adopted. The conditioning house exists for the settlement of disputes on plain lines, and wool traders feel that their problems are already too complex to warrant any venture likely to make their difficulties greater. Although the self interest of local traders is at the bottom of the matter it is one affecting all who are affected by insecure wool values. The present organization is a deterrent to the kind of speculation that is fostered by the admission of "differences."

An interesting simplification of pile weaving is due to the ingenuity of Prof. A. F. Barker, of the Technical College, Bradford. The arrangement makes it possible to produce pile goods on looms of any kind. Wires are used to form loops, but these are not transverse ones. The wires run parallel with the warp and the looping is formed by the use of doup heddles which carry down the ends at each side of each wire. Thus a loop is made which looks as though it came from the filling, as it is set at right angles to the direction of the warp. One end of the wires rests in a simple frame at the back of the loom and the other end remains in the piece until disengaged by the taking-up of the cloth upon the beam. Obviously such wires need no removing, as is necessary in looms of the older type, and this explains why weaving can proceed at a rate of from 90 to 120 picks per minute. The addition is quite inexpensive and considerable interest is being taken in it by producers of astrakhan and kindred cloths.

Flannel cloths for a season or two have tended towards a sameness of color and style



ENGLISH FLANNEL.

not entirely in their favor. A change is ushered in by the patterns of the Mains Manufacturing Company, of Carlisle, whose styles have been greeted by a rush of orders beyond all possibility of execution. Goods from fine woolen yarn, free from cotton, cannot be called dear at 28 1/2 cents for 7 1/4 ounce weight, 42 inches wide. As the dimensions indicate, these cloths are for dresses and costumes, but they are quite capable of enlargement to meet masculine requirements. Blue gray is the dominant coloring, with dark gray and a fair white added. The handle varies a little with the change of construction, but in every case the goods are essentially smart. In their own way, the Mains' patterns are somewhat of an object-lesson to manufacturers of light woolens from short material, and an examination of the samples can scarcely fail to afford hints or suggestions.

The first cotton yarn was spun by machinery in England by Wyatt in 1730.

COST KEEPING IN A COTTON YARN MILL.

BY M. A. COOPER.

The following report is copy of a weekly sheet issued to the directors of an English cotton yarn spinning company, comprising two mills, containing in all 101,000 spindles, rings and mules, spinning 30/40 warp and 30/50 filling, enabling the managers to be in touch practically all the time with the working of the concern. In addition, this report affords a reliable method of anticipating the result of the quarterly stocktaking For the sake of comparison, the values have been converted into American money.

A report has been selected showing a broken week at No. 1 mill, so that the effect on the various costs, etc., may be noted, and the sheet is shown in sections, being too large to print in complete form, without condensing.

Taking the items on the report seriatim: 1, Stock of cotton in bales in the mill, warehouse, and in the mixing room, is checked every week for the report; 2, Cotton in process is taken at the average of previous quar

No 4 Report Week Ending Nov 28/04.

		No 1 Mill.				No 2 Mill.		
		Rings						
		Beams	Bales	Twist	Weft	Twist	Weft	Total.
1.	Stock Cotton last week							891
2.	Cotton in Process							270
3.	Purchased this week							483
4.	Total							1644
5.	Cotton used							160
6.	Present Stock - Bales.							1484
	" - lbs.							638120
7.	Yarn Stock last week	7947	20270	3065	12329	3470	10130	57211
8.	" Spun this week	6497	—	8424	18174	5354	30856	69305
9.	Total	14444	20270	11489	30503	8824	40986	126516
10	Yarn delivered	7572	7080	6278	23596	5807	32553	82886
11	Assumed Stock	6872	13190	5211	6907	3017	8433	43630
12	Actual "	7167	13190	5811	8239	3290	10700	48397
13	Gain in Cellar/6.87%	295	—	600	1332	273	2267	4767
14	Cost of Mixing	10.88	—	10.88	10.64	10.62	10.38	10.62
15	Loss at Spidle Point	13%	—	13%	13%	13%	13%	13%
16	Cost " " "	12.50	—	12.50	12.22	12.20	11.93	12.20
17	" Wages per lb.	3.54	—	1.88	2.26	2.22	2.42	2.42
18	" Expenses " "	1.16	—	.80	.88	.68	.78	.84
19	Total Cost " "	17.20	—	15.18	15.36	15.10	15.13	15.46

terly stocktakings, which invariably shows one pound per spindle.

The sales of yarn are covered at the discretion of the manager with purchase of "futures" or actual cotton; The later comprises item 3; 4 is the total cotton on hand at the time of making out the report; 5, Cotton used is deducted showing the stock in bales and pounds; 6, Which will be the basis for the commencement of the next week's report.

The yarn from the spinning rooms, 8, is all weighed carefully, entered in a book, and

added to the stock in the cellar, 7, which is taken from the previous report. These two items together compose 9, which with yarn delivered to customers, 10, deducted constitutes item 11; the latter shows the assumed stock, or what the amount of perfectly dry yarn would be. As the actual stock, 12, is more than item 11, the difference shows the cellar gain, 13.

The cost of mixing, 14, is taken from the gain and waste sold, worked out in value per pound, deducted.

Item 19 shows the cost of producing average counts spun. Item 20 is the average counts produced during the week, and the weight spun of each count is reduced to hanks, and divided by the spindles to obtain item 21, while 22 is ascertained from the various counts delivered, 23 being the average price of same.

		No 1 Mill.				No 2 Mill		
		Rings						
		Beams	Bars	Twist	Weft	Twist	Weft	Total
20	Avg Counts Spun	36.00	"	33.00	38.00	33.00	39.40	38.31
21	" Hanks per Spdle	30.50	"	24.05	24.78	27.97	27.20	26.45
22	" Counts delivered	36.00	34.00	34.52	37.70	33.00	39.22	37.23
23	Price of deliveries	18.66	17.82	17.02	16.18	15.86	16.42	16.68
24	" Yarn on order	18.28	"	16.40	16.34	16.40	16.34	16.50
25	Avg Cts " "	36.00	"	33.48	38.79	33.48	38.79	38.01
26	Weight " "	53662	"	37154	279615	37153	279615	687199
27	" Yarn to sell							—
28	" Cotton to buy							(Bales) 682
29	Gain this week	94 $\frac{24}{00}$	"	155 $\frac{00}{00}$	119 $\frac{23}{00}$	40 $\frac{68}{00}$	398 $\frac{72}{00}$	$838 $\frac{26}{00}$
30	Loss " "							—
31	Total gain ~~or loss~~ 4 weeks							$2069 $\frac{16}{00}$
32	" Yarn del^{d} " "							342427
33	" " Spun " "							287417
34	Avg price delt "							16.46
35	" " Cotton used " "							10.88
36	" Margin " "							5.58
37	" price Cotton bought							10.88
38	Wages for the week				801 $\frac{02}{00}$		869 $\frac{04}{00}$	$1670 $\frac{06}{00}$
39	Coal consumption				70 tons		54 tons	124
40	" Cost				210 $\frac{00}{00}$		162 $\frac{00}{00}$	$372 $\frac{00}{00}$

price of the actual cotton used, every lot being tested for loss, and entered in a book kept for the purpose, the average percentage of loss comprising item 15. The cost after the loss has been fixed, is represented by 16, to which is added wages per pound, 17, including directors' fees and salaries.

Expense per pound, 18, comprises in addition to ordinary working expenses, depreciation, interest and insurance, but with cellar

Items 24 to 26 inclusive, are obtained from the yarn order book, which specifies the price, counts and weight of all contracts.

Items 27 and 28 show whether the concern is long or short of cotton; if "long" there is yarn to sell; if "short," cotton to buy. 29 and 30, probably the most interesting on the sheet, is the difference between the average cost of production (15.46) and the average price obtained for yarn delivered (16.68), and

shows the gain or loss on the week's working.

The accumulated gains or losses are brought forward weekly, and shown on item 31. The next two items, 32 and 33, are useful to show whether the present week's deliveries and production are up to the average of the previous weeks. 34 to 36 show whether the margin is keeping up to the average. A comparison of item 37, average price of cotton bought, with item 24, average price of yarn on order, shows at a glance what the margin will be for several weeks in advance.

Item 38 is the total wages paid in each mill for the week; 39 and 40 is the coal to each mill, which is weighed and charged separately.

The oil, 41, is measured out to each overseer and engineer, a record being kept in the storeroom. 42 is ascertained from the recorder on the engine, and shows whether there has been any gain or loss in the number of strokes registered; while item 43 shows the gain or loss in actual time.

Item 44 gives the actual working indicated horse power of engine, compared with nominal horse power, and 45 is the consumption of coal per I.H.P. per hour. 46 shows the quantity of waste made of various kinds, which is taken from the rooms daily; other waste, such as reelers, winders, and warpers hard waste, etc., is not shown on the report, but a record is kept of all waste made, and the value of same calculated weekly, and deducted from expenses per pound, as mentioned previously in item 18.

47 is the weight of bad cops from the spinning rooms, each spinner's work being examined every day. Items 48 to 51 are the average productions of the different machines in the card room, according to the indicator affixed to each frame.

The last blank contains a record of every sale of yarn, which is entered in detail on the report, and also full particulars of each purchase of cotton made during the week.

While a report of this description requires a large amount of detail work, the informa-

		No 1 Mill			No 2 Mill		
41.	Oil used - Engine			15 gals.			10 gals
	Spidle			35 "			34 "
	Cylinder			12 "			15 "
		nominal	actual	gain	nominal	actual	gain
42	Revolutions of Engine	95040	95802	762	149160	156394	7234
43	Hours worked	49·30	49·53	23	56·30	59·14	164
44	H. P. of Engine	1150	1080		830	780	
45	Coal per I.H.P. lbs			2.84			2.56
		Droppings	Cards	Spinners	Droppings	Cards Totals	Spinners
46	Waste No 1 Mill	1073	531	236			
	do - 2 "	1096	571	269	2169	1102	505
47	Weight Bad Cops			280			450
48	Avg Drawing Frame H's		44.6			53.6	
49	" Slub " "		44.6			48.0	
50	" Inter " "		44·5			47·5	
51	" Roving " "		39·0			41·0	

The last blank contains a record of every sale of yarn, which is entered in detail on the report, and also full particulars of each purchase of cotton made during the week.

tion it contains is of great assistance to the officials. "Narrow margins" and "close cutting" in the cotton trade, render the adoption of an accurate system of cost-keeping an essential to the successful management of the business, and to a thorough practical cotton mill man the difficulty of compiling such a report as this is not so great as might appear on the surface.

Yarn Sold.

Date	To Whom	Weight	Counts	Price	Terms
Nov 23/04	S. N. & Sons	5,000	42 W	17 3/4	4%
"	R. H. & Co.	30,000	38 "	17 1/4	"
"	W. H. & Co.	5,000	36 T	17 3/4	3 1/2%
"	R. W. & Bros	30,000	40 W	17 1/2	"
"	F. R. G. & Co.	20,000	30 T	17 1/4	4%
"	G. H. O. & Co.	20,000	34 "	17 1/2	"
Nov 24/04	S. N. & Sons	5,000	42 W	17 3/4	"
"	R. H. & Co.	30,000	38 "	17 1/4	"
"	W. H. & Co.	20,000	30 T	17 1/4	"
"	A. R. Bros	10,000	32 "	17 1/2	"
"	J. F. & Sons	5,000	40 W	17 1/2	3 1/2%
"	S. N. & Sons	10,000	36 T	17 3/4	"
"	D. R. & Co.	10,000	38 W	17 1/4	4%
"	F. R. & Co.	20,000	36 "	17	3%
	Total =	220,000			

Cotton Bought.

Date	Buying Broker	Selling Broker	Bales	Class	Price
Nov 23/04	E. B. R. & Co.	W. I. & Co.	160	Texas	10 3/4
"	do.	do.	100	"	10 1/2
"	do.	J. R. & Sons	20	Orleans	10 3/4
Nov 24/04	F. L. & Sons	S. E. & Co.	103	"	10 1/2
"	do.	do.	100	Texas	10 1/2
			483		

Rough Peruvian cotton, the only grade exported to this country, has so close a resemblance to wool that it can be distinguished only by chemical tests. It is used exclusively in the manufacture of goods which are sold by the retailers as all wool.

TEXTILE PRODUCTS AND WAGES.

(*From the Saturday Review, London.*)

Sir: Your readers may like to see this analysis of the value of the products of a textile factory, designed to show the comparative proportions which the value of the fibre, direct wages and other costs, bear to one another in the various main processes of the textile industry, extracted from actual records covering the five years, June 1, 1899, to May 31, 1904. The following table assimilates the total results and assumes a uniform value of the product of £100,000, with a view of providing an easier comparison of amounts.

	Description.	Wool Merchanting. Am'nt.	Proportion.	Top Making Am'nt.	Proportion.
A.	Cost of fibre	£ 95,671	95.7%	£ 84,638	84.6%
B.	Textile wages	589	.6%	6,886	6.9%
C.	Materials containing wages	605	.6%	4,434	4.4%
D.	Other charges not involving wages	3,135	3.1%	4,042	4.1%
		£100,000	100.	£100,000	100.

	Description.	Yarn Spinning. Am'nt.	Proportion.	Cloth Weaving. Am'nt.	Proportion.
A.	Cost of fibre	£ 63,985	64.0%	£ 34,278	34.3%
B.	Textile wages	13,806	13.8%	30,067	30.0%
C.	Materials containing wages	8,811	8.8%	18,179	18.2%
D.	Other charges not involving wages	13,398	13.4%	17,476	17.5%
		£100,000	100.	£100,000	100.

An abridged schedule of the elements of cost.

A. Actual fibre.

B. Wages of our own work people. Ascertained proportion of wages of payments for work done outside in sorting, combing, spinning, weaving and dyeing.

C. Machinery, fittings, sheets, skips, bobbins, tubes, gills, fallers, healds, slays, castings, iron, hardware, leather, oil, coal, boiler, and engine requisites. Carriage of merchandise, etc

D. Rent, rates, taxes, insurance of own works and outside works, subscriptions, allowances, bad debts, interest, profit, etc.

W. H. MITCHELL.

A NOVEL FULLING MILL.

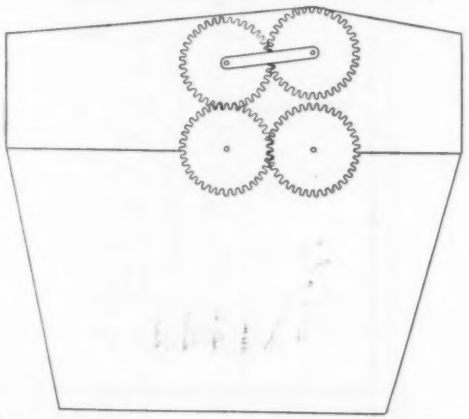
Editor Textile World Record:

About twenty-one years ago when I was employed by the Merchants Mills, then owned and operated by Charles L. Harding, I built a fulling mill which had several features that will doubtless interest your readers. Although the mill was built so long ago that it cannot now be called new, yet it is in a certain sense entitled to be so called because I believe very few fullers at the present time are acquainted with its peculiar construction.

Mr. Harding always advocated keeping plenty of help in the repair shop so that in case of a breakdown in any part of the mill the repairs could be made promptly and the machinery started with the least possible loss of time. When not busy in such cases of emergency the extra help were kept employed building new machines for the mill. In this way we built the dyeing machines, crabbers, washers and fulling mills.

About 1883 there was considerable trouble with mill wrinkles in the finished goods The finisher tried every means he could think of to remedy the difficulty, but without success. I was called upon to suggest remedies. I watched the operation of the mill and discovered that the cloth after coming from the crimping boxes passed to the bottom of the mill which was very narrow from front to back. Here the pieces would become jammed into a solid mass and as they passed again to the rolls the same wrinkles would be in them as when they went through before. This resulted in irregular fulling which caused the streaks in the finished goods.

I was convinced that the only remedy for



the streaks was to use a mill of a different form so as to have the wrinkles in the goods change their position at each revolution of the pieces. I built a mill for this purpose in which the width from front to back was double that of the old mills, being about 8 feet inside measurement. The centre of the rollers was only 5 ft., 5 in., from the back of the mill. This gave an extra amount of space on the other side where I placed a very long crimping box which filled the whole distance from the rolls to the front of the mill. The extra space under the crimping box gave plenty of room for the cloth to remain in the back part of the mill until pulled forward around the front carrier roll to the fulling rolls. This long stretch gave the cloth a chance to open out and when it entered the rollers again the folds were formed in new places, thus avoiding the irregular fulling which caused the streaks.

The fulling rolls were about 22 inches in diameter with 9-inch face. The upper roll was driven as shown in the illustration by connecting the gearing of the lower roll with two intermediate gears, the upper one of which drove the upper roller. These gears were each 18 inches in diameter. The gears of the main rolls were far enough apart so they did not come together when the mill was empty. The upper roller rested in the box, which was fastened in a frame that swung at its other end on the stud with the upper intermediate gear. In this way the upper gear was kept in gear with the intermediate no matter how high the cloth raised the upper roller.

We built several of these mills geared in this way and then built some in which the upper roller was driven by pulleys and belts instead of gears. The crimping boxes were 9 inches wide so that they could be slipped up to the roller shaft each side of the roll. The top of the box was long and heavy enough so no extra weight was needed to hold the cloth in place. We fulled many thousands of pieces in these mills and never had a mill wrinkle. They ran very easily and fulled the cloth rapidly.

The first mill was built while Mr. Harding was in Engalnd. On his return he examined the machine and said that in all his travels through Europe where he visited many mills, he did not see one fulling mill that ran as well as the one I had just built.

While in course of construction the mill attracted much attention from the help throughout the mill and it came in for much unfavorable comment. The superintendent and overseers were dead set against it, Tom Crewso, the super, being especially emphatic in expressing his opinion of the new machine. So much was said against it that when it was finished I let it stand in the machine shop for several weeks. Finally Mr. Crewso asked me why I did not set that machine up. I said there had been so much said against it I concluded there was no use in setting it up.

"Well," he said, "you might as well set it up and have it either running or out of the way before Mr. Harding gets home."

I put it into position, belted it up, and the fuller put a set of pieces into it. The super, the finisher, the boss fuller and the dyer were all standing around watching what they expected to be a complete fizzle. When the pieces were fulled up to width they were pulled out and examined. Not the slightest trace of a wrinkle was to be found. It was then my turn and I felt that he laughs best who laughs last. EBEN GOULD.

LOW WOOLEN DRESS TWEEDS.

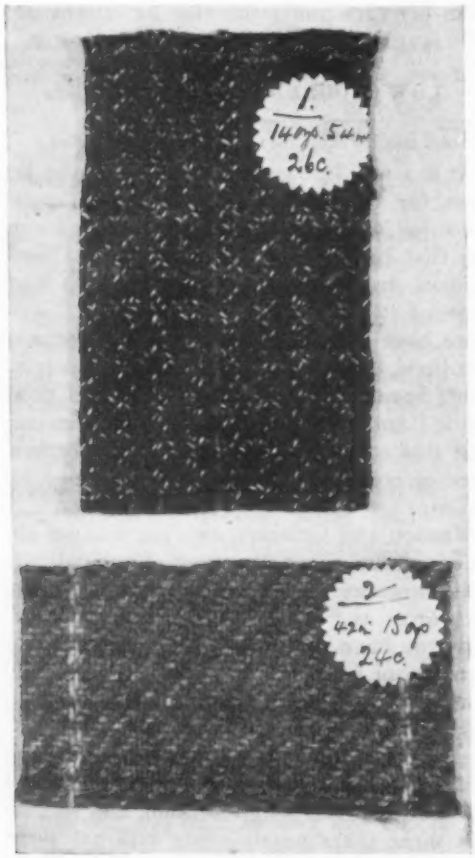
(Specially Written for the Textile World Record.)

It is a well known fact that the gentler sex have for three years showed considerable favor for "chevioty" dress fabrics, this meaning that the average manufacturer in Bradford of dress goods has had rather a hard time of it. The woolen districts of Yorkshire have been kept busy at the expense of Bradford, simply because the fine merino stuffs have not been fashionable, and I don't think I am wide of the mark in prophesying that this coming season will see a continuance of conditions which have prevailed for so long.

Yeadon and Guiseley, two big villages situated about six miles from Bradford, are well known even to American importers, and such firms as Peates, Moons, Ives and Murgatroyd, have a world-wide reputation for turning out fabrics for dress purposes second to none in the world. Some few years ago this district experienced very hard times, when several well known firms went to the wall. However, prosperity has once more dawned upon this neighborhood, and for the past three years nearly every mill has been very busy indeed. It is the low woolen tweeds made in that district that I want today to introduce to American manufacturers, for those who can imitate them are certain of a fortune. I have before me as I write 11 set of patterns, all being made today, and it is somewhat hard work to make a selection. However, I will show two or three. The fact that they are very easy to make should recommend the cloths to manufacturers in the states.

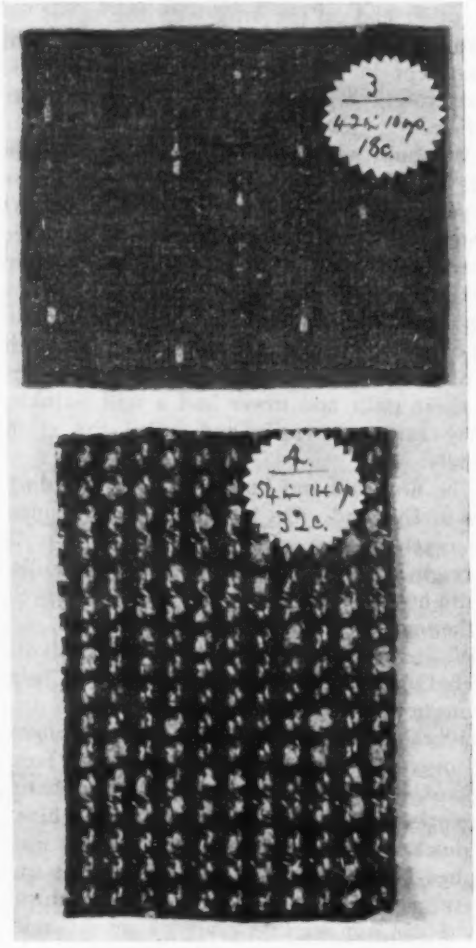
The first cloth we will consider is really a low cap tweed, (Fig. 1,) but a cloth that is attractive and has proved a good seller. It is indeed of very simple construction, and

will also make up well for ladies' skirts. In this cloth we have shown distinctly the use that is being made of black and white cotton twist, and this is increasing in consumption very rapidly indeed. Half the warp is black,



spun to 2 runs. The other half is black twisted with single 20's cotton, this bringing the twist thread down to 1.7 runs. There are 20 ends to the inch in the warp, which is warped three and three, while a green thread is introduced every two inches and crossed accordingly in the weft in order to take off the plain appearance and produce the mingled effect seen in the pattern. I would just like to say here that nearly all of the woolen tweeds both for men and women's wear now being made have this over-check, the squares being anywhere from 1 to 2 inches in size.

It is worth while mentioning here that all the rainproof coverts for next season show this overcheck, and signs are very strong that we are going to have a good run in this style of fabric. The weave employed in pattern No. 1 is the four-end twill. The pattern is drafted in the warp twelve threads each way, this helping to increase the broken up effect or the mingled appearance which the cloth presents. The cloth weighs 14 ounces, 54 inches, and is sold at 26c. per yard



—a marvel of cheapness. This cloth is also made in a heavier weight, namely 18 ounces, 54 in. at 36c. per yard.

Pattern No. 2 is a low dress tweed out and out, and for style is just the ticket for the million. It is a cheviot in both warp and

weft. The yarns are spun to 2 runs skeins both ways, and set 24 ends and picks per inch. It is warped 46 threads gray, one yellow knop cotton, four gray, two white, and the weft is in the same order. This cloth weighs 15 ounces, 42 inches, and sold at 24c. per yard.

Cloth No. 3 is decidedly inferior to the two previous ones, but for "slopping" trade and the poorer classes it will do very well. This is a low dress woolen tweed, the blend being made of 50 per cent. mungo, and 50 per cent. cotton. The price of the mungo here per lb. is only 4c., so the reader can judge of the poor quality of the material. It is woven plain in two shafts. There are twenty ends to the inch, and about 22 picks. This cloth is milled like all the rest to get a nice soft handle, and to hide from view the looseness of the fabric. The cotton knop is used to give an effect. Here again a green woolen yarn is introduced to give the overcheck, and thus increase the attractiveness of the cloth. The cloth is 10 ounces, 42 inches, 18c. per yard.

Cloth No. 4 is a different article altogether to what we have hitherto considered, this being a low light woolen mantle cloth. It has a most effective appearance, and for those wanting show, it is just the thing. The white in the cloth is supposed to be a woolen yarn composed of 75 per cent. of cotton and 25 per cent. of wool noils or anything of a woolen nature, such as pulled white flannels. It is then twisted after being spun to 2 runs skeins with a single 16's cotton thread. While being twisted the woolen yarn is taken up every 1 1/2 inches to make a knop, this producing a spotted appearance in the finished fabric. The cloth is warped 2 ends white knop, 2 black, 2 white knop, 2 brown. The weft is all made from a low mungo costing the manufacturer 4c. per lb., spun to 2 runs. The weft pattern is 26 picks green, 2 black and white twist, 6 green. Woven about 22 picks to the inch, the warp ends being about the same. To my mind this is the smartest cloth in all the lot and one deserving the most attention. It weighs 14 ounces, 54 inches, 32c. per yard.

In the Yeadon and Guiseley district there are made other leading fabrics, but those outlined will indicate a few are worth imitating, and at some future date I will consider others equally as attractive and which are all used in England and throughout the world. When the Wilson tariff held sway some large lines of these goods were shipped to the United States, and it is only the present high duties that prevent large quantities from being shipped today.

EXCESSIVE MOISTURE IN RAW COTTON.

BY A YARN MILL SUPERINTENDENT.

(Leipziger Monatschrift fuer Textil Industrie).

At the Turin Congress in 1875 the standard of moisture for cotton yarn was fixed at 8 1/2 per cent. of the absolutely dry weight. As a consequence of the adoption of this as the legal standard the spinner is not allowed to deliver yarn with more than 8 1/2 per cent. of moisture. On the other hand he endeavors to keep it as near as possible to this limit in order that he may suffer no loss by reason of having less than this amount of moisture in the yarn. It often happens that the raw cotton is very damp when received at the mill. This has been especially true of this year's crop. Tests of raw cotton in conditioning houses show from 12 to 14 or even more per cent. of moisture instead of the 8 1/2 per cent. which is allowed. If the purchaser complains of damp cotton he obtains no satisfaction because the rules of the Bremen cotton exchange give him no redress. Under the most favorable circumstances the next lots of cotton are examined and an allowance of possibly 1 or 2 per cent. made for excessive moisture. The traders in Bremen estimate the moisture in cotton by feeling of the stock with the hand. Even with the greatest skill such methods result only in a very rough approximation of the condition of the cotton. It is therefore very desirable that means should be provided for establishing a standard for moisture in raw cotton and bringing the trade to conform to regulations based upon it.

In the following table are given the results of several tests of raw cotton and cotton

yarn. They show plainly the loss to the spinner by reason of the excessive moisture in the material and the strict requirements regarding moisture in the yarn to which he is compelled to conform:

Test.	Before drying	After dry ng	Condi. tioned grains	Condi. tioned per ct.	Conditioned above or be. low original weight		Per ct. moist'r origina weight
1a....	1000	889.7	965.32	96.532	3.468	below	11.03 *
1b....	1000	899.1	975.52	97.552	2.448	"	10.09 *
1c....	1000	855.5	928.2c	92.82	7.18	"	14.45 *
1d....	1000	888.4	963.91	96.391	3.609	"	11.16 *
2	500	445.8	483.09	96.738	3.262	"	10.84 †
3a....	465.4	440.	477.40	102.578	2.578	"	5.458‡
3b....	465.42	441.2	478.70	102.854	2.854	"	5.204‡
3c....	457.74	424.6	460.69	100.645	645	"	7.240§

* Cotton from bale. † Cotton from batch. ‡ Yarn from mule. § Yarn from storehouse.

These tests are selected as showing the average of a very large number. Assuming that the spinner manufactures yarn from cotton containing moisture equal to the average of the first four tests of raw cotton (11.682 per cent.) but that his yarn after remaining in storage and when offered for sale contains only 7.24 per cent. of moisture, the loss resulting from this difference will amount to 4.442 per cent. of the net weight of the cotton. Even when the yarn contains the standard amount of moisture (8 1/2 per cent. of the dry weight or 7.83 per cent. of the net weight) the loss to the spinner would still amount to 3.848 per cent. It is thus seen that when the spinner maintains the moisture in his yarn to the extreme limit (8 1/2 per cent.) the loss caused by the excessive moisture in the cotton is enormous and enough to cause a serious deficit in a year's business.

The spinner makes his calculations and fixes the selling prices on his yarns accordingly, but if the cotton used during the year contains such a large quantity of moisture as is shown in our tests the profit that he hoped for is converted into a loss. This question of moisture in cotton is, therefore, a very important one in view of the very narrow margin of profit on which yarn is manufactured and sold. When balancing the books at the end of the year, a loss due apparently to an unusually heavy shrinkage in the weight of the cotton is often disclosed. The mill manager is accustomed to seek for the cause in different processes, while the trouble is due entirely to excessive moisture in the raw cotton.

In addition to the heavy loss which may arise in this way the excessive moisture is apt to make serious trouble in working the stock, preventing the proper cleaning of the cotton and causing many other defects. When the loss in manufacturing is found to be due to excessive moisture in the raw material the remedy for similar trouble in future is to insist that the cotton merchant shall deliver cotton with no more than the standard amount of moisture. A clause should be inserted in the contract to this effect. The spinner cannot afford to neglect giving his attention to this matter. Samples of the raw cotton which he is using should be frequently sent to the conditioning house, and he will find it an excellent plan to install conditioning apparatus in his own mill where he can make tests regularly to determine how much water he is buying with his cotton.

COTTON GROWING IN BRITISH AFRICA.

In a Government report, which treats of the trade of the British Central Africa Protectorate for the year ended March 31 last, attention is drawn to the large increase in the cultivation of cotton. This increase appears to have constituted the most noticeable feature in the trade of the Protectorate during the past twelve months, and which was due, of course, to rise in value of the staple. The total export of cotton from April 1, 1903, to March 31, 1904, was 20 tons. In the latter part of 1903, however, planters having fairly proved that the Protectorate can produce a high quality of cotton at a reasonable cost, commenced to plant all the ground they could get ready for the rainy season, which began in November. The total area planted by February, 1904, amounted to about 8,000 acres. The season has been a good one, the rains ample, and there is every prospect of a large crop, probably from 800 to 900 tons of clean cotton.

One of the beneficial results of the completion of the railway through the Shire Highlands will be that not only will a means of transport be provided, but many thousands of natives who now carry loads and do no other work will then be free for employment upon cotton plantations.

Planters are of opinion that so long as the price in Liverpool for the description of the cotton grown in the Protectorate does not fall below 8 cents per lb., its cultivation will be remunerative. As the chief expense in the cultivation of a comparatively cheap product is the cost of transport, it seems probable that, should this industry develop largely in British Central Africa, the localities likely to be most in favor are those bordering on the Lower Shire River, where the crop can be put straight on board barges and taken without delay to Chinde, the shipping port, thus saving the expense of land carriage at present incurred by planters in the Shire Highlands. One company has already taken steps to put into cultivation some 6,000 acres near Chiromo, on the bank of the river.

In addition to cotton developments in the Shire Highlands, a very considerable acreage has been planted in the southernmost portions of Angoniland, west of the Shire River. Such cotton as has been up to the present exported from this district is made up in small bales of about 50 lbs., which are carried on the heads of native porters, and travel overland to the Shire River at Katunga, whence, if there is sufficient water in the river, they are sent down to the coast by barge or steamer. There is a large amount of excellent cotton land bordering on the Shire River between Catunga and Chiromo. Practically the only enemy to the cotton plant as yet met with in British Central Africa is the locust, but fortunately this pest, which was greatly in evidence a few years ago, has been gradually dying out. This year scarcely any locusts have been seen in the country.

In an annex to the report, W. W. Miller, Superintendent of the Zambesi Industrial Mission, gives the following as a reliable estimate of the cost per acre to raise cotton; all items are taken from actual figures:—

All expenses, including European management, felling timber and cultivating	$7.29
Cost of harvesting	.72
Ginning and baling (230 lbs.)	3.12
Freight, Blantyre to Liverpool, and insurance	3.44
Brokers' commission and discount	.72
Dock charges and porterage from wharf, etc.,	.60
Interest on capital	.72
	$16.61

Cost to raise and deliver to salesroom, 7 1/4 cents per lb.

In this connection it may be of interest to note that the average cost of raising cotton in the United States is about 5 cents per lb. —Textile Mercury.

WATERED JUTE.

A Calcutta dispatch in the Rangoon Gazette of November 7, 1904, says that the subject of the fraudulent watering of jute in Bengal is engaging the attention of the Bengal Chamber of Commerce, and the committee has distributed to the members a note on the practice, together with the draft of a short act designed to put a stop to it. These papers have been received from the director of the department of land records, who has been induced to move in the matter at the instance of the Calcutta Baled Jute Association. Inquiries instituted by Mr. Maddox have disclosed the fact that the fibre sold at different jute marts varies a good deal in the amount of moisture it contains. The practice of watering, which has assumed serious proportions only during recent years, results in a weakening and discoloration of the fibre, and is said to be the chief cause of the deterioration of which the trade complains, while at the same time confessing itself powerless to put a stop to the fraudulent practice. The draft act provides for the appointment of inspectors of jute and a scale of penalties for offenders. The question is regarded by the committee of the chamber of commerce as of the utmost importance, and the members are requested to furnish their replies in the course of a fortnight.

The area each year placed under the cotton crop in the United States ranges from 26,000,000 to 29,000,000 acres.

Questions and Answers.

Under this head we undertake to answer, free of charge, to the best of our ability, any pertinent inquiry pertaining to textile matters received from any regular subscriber to the TEXTILE WORLD RECORD. Questions should be stated as briefly and concisely as possible. Inquiries pertaining to textile processes, machinery, improvements, methods of management, the markets, etc., are especially invited, as well as any legitimate discussion on the views expressed. All inquiries must be accompanied by the name of the person inquiring, not for publication, but as an evidence of good faith.

For reply to questions that are not of general interest to readers of textile journals, such as those relating to the composition of yarns, analysis of fabrics, etc., we will charge the enquirer with the cost of the investigation.

Leno Fabric.

Editor Textile World Record:

Will you publish directions for weaving the enclosed leno cloth? Brandywine (516).

The desired information is given in another part of this issue.

Size and Cost of Ply Yarn.

Editor Textile World Record:

We make a line of plated goods from a combination of cotton and worsted yarn. The cost of each kind of yarn varies from time to time, and it is frequently necessary to change the sizes. How are the size and cost of the ply yarn calculated from the sizes and cost prices of the single strands?

Molly Stark (507).

It is first necessary to reduce the counts of the single strands to the same basis, and we will select the cotton count for such a base. The various operations can best be explained by practical examples:

Ex. A knit fabric is made with a No. 10 cotton costing 24 cents and a No. 24 worsted costing 60 cents per pound. Find size and cost of the 2-ply yarn.

No. 24 worsted=(24×⅔) No. 16 cotton.

The size of a 2-ply thread is equal to the product of the single counts divided by their sum:

(10×16)÷(10+16)=No. 6.15, ply yarn.

For this problem, which involves the cost of the ply yarn, it is preferable to use for calculating the size another method which also gives the proportionate weight of each single thread in the ply yarn. For this purpose we select any convenient number of hanks, say in this case, 16, and calculate the weight of that number of hanks for each single strand:

16 (hanks)÷10=1.6 lbs. No. 10 yarn.
16 (hanks)÷16=1 lb. No. 16 yarn.

16 hanks= 2.6 lbs. ply yarn.

16 hanks of the ply yarn thus weigh 2.6 pounds. The number of hanks per pound or the count of the ply yarn is, therefore:

16 (hanks)÷2.6 (lbs.)=No. 6.15, ply yarn.

The cost of the ply yarn is found as follows:

1.6 lbs. No. 10 @ 24c.	$.384
1 lb. No. 16 (No. 24 worsted) @ 60c.	.60
2.6 lbs.	$.984

$.984÷2.6 (lbs.)=38 cents per lb., ply yarn.

If the ply yarn consists of more than two threads the same process is adopted, but extended to include the additional strands.

If it is desired to know what size is required for a single strand to make a given size of ply yarn with a strand of given size, the operation is as follows:

Ex. Find count of cotton yarn to run with a No. 30 worsted to give a No. 6.15 (cotton basis) ply yarn.

No. 30 worsted=(30×⅔) No. 20 cotton.

Take a convenient number of hanks, say, 30, for a basis. The ply yarn is to measure 6.15 hanks per pound. Then the weight of 30 hanks of ply yarn is thus found:

30 (hanks)÷6.15 (hanks per lb)=4.9 lbs. ply yarn.

The weight of the worsted yarn in 30 hanks is:

30 (hanks)÷20 (cotton hanks per lb.)=1.5 lbs. worsted.

The difference between the total weight and that of the worsted yarn is (4.9—1.5) 3.4 lbs., which must be made up by 30 hanks of cotton.

The number of hanks per pound or count of this cotton yarn is, therefore:

30 (hanks)÷3.4 (lbs.)=No. 8.8, cotton yarn.

A No. 8.8 cotton must, therefore, be run with a No. 30 worsted to make the ply yarn equal to a No. 6.15 cotton.

Calendering Cloth for Flour Bags.

Editor Textile World Record:

We have a five roll calender, three rolls heated by steam, and wish to finish ordinary plain cotton goods used for flour sacks. At present we are using a preparation consisting of boiled starch, lard oil, paraffine, and a little China clay, and while it gives a very fair finish it does not give the finish we desire. We want the goods to have a fine gloss, the nap to be laid down and the goods when finished to be rather stiff. Please tell us the proper mixture to put on the goods when calendering to bring about these results.

Bangor (514).

To make 100 gallons of mixture suitable for filling cloth used for flour bags, mix 100 pounds China clay, 50 pounds corn starch, and 7 pounds of tallow. Boil, and fill on friction mangle, dry on cans, cool, and then sprinkle and calender with hot calender. For lower grade goods add to the above

mixture 50 pounds of flour, and finish in the same way. The fact of the nap not being laid on the sample submitted and the absence of the firm feeling wanted, are both due to the goods not being dampened before calendering. The nap could be removed by singeing, but is not advisable as it takes from the goods and is also unnecessary if the foregoing instructions are followed.

Cymbal.

Following are directions for making a starch for goods like the sample enclosed: 80 pounds rising starch, 20 pounds sulphate magnesia, and 25 gallons water. Boil for six hours and put in barrels to use as needed.

A preparation for filling the goods is made with 50 gallons of water, 2 pounds corn starch, 15 pounds rising starch soap (made as above), 5 pounds sugar starch for gloss, 2 pounds salt. Boil for 20 minutes and put on the cloth when cold. The calender rolls should be very hot. If the cloth comes out too stiff use less of the rising starch.

Quadrangle.

It seems to me that Bangor has the remedy for his trouble right in his own hands. From the sample of goods sent for inspection, it would seem that the goods could be made stiffer by using more starch and less lard oil; as for the paraffine I do not think it is needed at all. To lay the nap the goods should be sprinkled before calendering, and if all the nap must come off the goods must be singed. With a five-bowl calender, three of them steam heated, there should not be the least trouble in getting a good gloss, as it is easy to get a gloss with a three-bowl calender, one of the bowls steam heated. I would say, use more starch, less oil, and sprinkle to lay the nap. Baumwolle.

Sticky Warps.

Editor Textile World Record:

Lately we have had a good deal of trouble with our warps sticking to the slasher cylinder. Can you tell us how to prevent this?

Cylinder (505).

As we do not know just what style of work Clyinder is running, we shall have to give some of the usual causes for warps sticking to the cylinder and leave him to decide whether any of them fit his case. The two principal causes are found in the size and the squeeze rolls. If the goods being run require a heavy size I should advise adding one pound of paraffine to every hundred gallons of water. To do this properly the wax should be shaved and mixed with a half a pail of water by boiling, and then added to the kettle of size. Be sure that the size is thoroughly cooked before using. Properly cooked size will feel smooth, like good engine oil, when rubbed between the thumb and finger, and just the least bit sticky as it cools. If it is so thick that the thumb and finger stick together there is either too much starch for the quantity of water or it has not been boiled long enough.

If the size is all right, look next to the finishing squeeze roll. This should have at least 10 yards of blanket, as follows: 3 1/2 yards of coarse blanket next to the iron roll, called No. 1; then 3 1/2 yards fine blanket, No. 2; and then 3 yards of fine blanket that has been run three days or longer, No. 3. Never put a new blanket on the outside, but when No. 3 wears out take off No. 2 and put the new one in its place and put No. 2 on the outside. This is necessary to make the yarn dry properly and not stick to the cylinder.

These are the most common causes for the trouble, but there are others that will produce it to a greater or less extent. Running the slasher too fast carries the size on to the cylinder and gums it so the yarn will stick. If there is too much cloth on the roll the yarn will break and the loose ends stick to the cylinder. After the trouble has been located it is necessary first to give the cylinder a good washing with soft soap and water. After wiping dry go over the cylinder with a piece of oily waste and then everything is ready to begin right. Thomas Barr.

Spooling Colored Cotton Yarn.

Editor Textile World Record:

Can you inform me as to the cost of skein spooling colored cotton yarn in English mills?

Square Deal (531).

A cotton manufacturer who has had a long experience in English mills answers this question as follows:

There are many different lists for spooling colored cotton yarn, each district having its own particular list, varying from 4 1/2 cents per bundle of 10 pounds for 10/20 T, to 11 cents per bundle for 50/60 T on warper's spools; and from 5 cents to 12 cents for same number on weavers' pirns. Some districts pay by the score while others have a standing weekly wage irrespective of weight spooled. Taking the average of the various lists the cost per pound will work out about as follows:

On Warpers' Spools.

10/20 T	.40 of a cent;	.50 on pirns
20/30 T	.50 of a cent;	.60 on pirns
30/40 T	.64 of a cent;	.71 on pirns
40/50 T	.80 of a cent;	.88 on pirns
50/60 T	1.00 of a cent;	1.10 on pirns

Cornwall.

KNITTING DEPARTMENT.

For Knitting Mill Machinery, Equipment and Supplies, see pages 232 to 253. Also Buyers' Index.

KNIT GOODS SITUATION.

There is no real improvement in the knit underwear end of the business since the time of our last issue. The show of strength in the price of cotton and the consequent checking in the decline of cotton yarns has not had the effect of inducing any great activity on the part of buyers.

In spring lines, the only scarcity evident is in some of the better numbers of men's balbriggans, but this is not sufficient to cause any advance in prices. On the lower end of men's stained balbriggan, some concessions are being made on the prices quoted for early orders. Manufacturers in general are making good deliveries on all lines of summer underwear and nearly all of them are in a position to accept duplicate orders for quick delivery, and in some cases at slightly reduced prices.

We illustrate herewith some new styles of German lisle vests from A. Doehner's line; some of the patterns of which are already being duplicated by domestic manufacturers in the lower priced numbers.

Jobbers report that a large business has been done on men's white underwear for spring, both in ribbed and flat goods, to sell as low as 50c. a garment, all of domestic manufacture. We have in mind one very handsome line of white ribbed lisle goods made by the Capron Knitting Co. of Utica, N. Y. It is now possible to sell a very good quality of French lisle flat garment at $1.00. These are being brought to this country by H. Jacquin.

In fleeced goods for fall, the situation has changed only slightly. The standard 13 lb. goods are still being held at $3.25, but some very creditable garments, weighing 12 lbs. on size 40, made with Prussian binding, are being offered at $3.00 per dozen. We understand the mill making this line has not as yet made any goods, it being a new organization, but some large orders have been taken on it and the mill agent states that the organization has a strong financial backing of Scranton capitalists.

A GERMAN LISLE VEST.

We notice that one line of Southern fleeced goods, weighing 11 1/2 lbs. on size 42, is still held at $2.97 1/2, and selling agents report that they are no longer anxious for orders at this price.

Men's 12 lb. ribbed goods made in fine stitch fabric may be had as low as $3.00. These are also Southern made goods; but the larger business is being done on the more attractively trimmed lines at $3.32 1/2 and $3.37 1/2. A number of buyers have criticised manufacturers making this line of goods and claim that they are not good enough now for 50c. grades and that, therefore, they will reach the retail as a 39c.

number, and on account of this, a prominent Utica manufacturer is showing a line of ribbed goods made from combed yarns at $3.62 1/2 which is believed to be the lowest price at which a combed fabric has been put on the market.

We understand that several large manufacturers are following the lead taken last month by Greenwich manufacturers and are showing ladies' ribbed goods weighing 7 lbs. at $1.75 and 8 lbs. at $1.90. On the combed goods no changes of any note have taken place and indications are that about the best

A GERMAN LISLE VEST.

price given for fine or tuck stitches weighing 8 1/4 to 8 1/2 lbs. on size 6 will be $3.50. We have learned of some fine stitch lines being quoted at 12 1/2c. and 25c. a dozen lower, but find that the weight has been reduced to 7 lbs. and the vests have also been trimmed up with less expensive trimming.

Ladies' extra size ribbed goods, weighing 7 3/4 to 8 lbs. may now be had at $2.00, and it looks as though this end of the business will be done this season on about the same close basis as the ordinary size business.

We find that considerable business is now being done with Europe by domestic manufacturers of ladies' ribbed vests and pants and men's fleeced shirts and drawers, and it is an end of the business that domestic manufacturers are carefully looking after, for the reason that it affords them a better margin of profit than the home market. One point is, that buyers there take what they buy at the price agreed upon, regardless of any decline in raw materials that may take place, whereas, buyers at home are not at all slow in asking for concessions in prices on orders placed, should the raw material market show the least symptom. Another reason is that a great many of the vests and shirts are taken with short sleeves and in small sizes, which lessens the weight of stock used. One state manufacturer showed us samples of English made flat goods that had been sent him to copy in a ribbed fabric in misses' and ladies' combination suits.

Business on wool underwear is about finished for the season and a number of manufacturers express themselves as having all the orders that they care to take on the present basis of wool costs.

The buyer's greatest difficulty has been to get up lines of ladies' and men's scarlets to sell at popular prices. Naturals and camel's hair may be manipulated to look much like last season's goods, but with the scarlet wool it is a different proposition and manufacturers are either forced to make lighter weights or to advance the prices very materially.

HOSIERY.

The hosiery end shows some signs of improvement, not in advanced prices, but in the fact that some lines of heavy cotton and wool goods are reported sold up and withdrawn. The high price of the past season has not restricted the demand, and stocks in the hands of jobbers and retailers are reported as being small. The recent slight advance in cotton and yarns may be only temporary, but the weakness shown by manufacturers in taking orders without a profit in sight has been checked and the chances are that it will not be resumed this season.

It is reported that retailers are placing plenty of orders with jobbers, but they are

somewhat smaller than usual, and it is evident that they are jockeying with the jobbers on prices, the same as the jobbers did with the manufacturers early in the season.

A considerable business has been done on spring goods recently and should the jobbers continue to duplicate as they have been doing, we may look for some slight advances, as manufacturers are in good shape in regard to orders.

Lace goods for ladies to retail at 25c. and over are somewhat scarce at present, but it is predicted by some that, owing to the tremendous quantity on order with German manufacturers for the United States trade that they will become a drug before the season is over. The Chemnitz report states they are hard to get and that not only the United States, but the entire civilized world has large orders placed for them.

Fine gauge goods are not in as much demand as formerly, especially in grades at 50c. and under. Better grades are fairly active. The new line of double feet goods have the advantage of better wearing qualities, but we do not think they appeal to the average trade and it looks as if the manufacturer who attempts to make them will find plenty of trouble in store for him.

CHEMNITZ REPORT.

Trade in the Chemnitz district is at the present time rather quiet. It is between seasons and while manufacturers have still a good amount of back orders on their books, new ones are not being added. Duplicate orders have not been received, except in limited numbers. They may come yet in March, as it is not too late for them.

Lace hose are asked for by the resident buyers and any lot that they can get for immediate shipment is eagerly taken. Deliveries on lace hose are slow, everybody getting some of the goods he had ordered, but plenty of orders due in January are not shipped up to now. Even with the largely increased facilities, the makers are not able to supply the demand, as now these goods are not only taken by the United States, but the market of the entire world is buying them.

In fine gauge goods, trade is good and makers have been receiving orders for the last few weeks which will keep them busy for months, until the season opens up again.

In fancy hose, striped goods are still dead, as far as ladies' goods are concerned; while for men's wear, they have sold very well for the coming spring season. In ladies' hose, embroidered styles are about the only fancies that are bought to any extent and in these, manufacturers are well supplied with orders, the small, neat hand-embroidered effects being most popular. In men's half hose, jacquard patterns have sold very well, especially on the low end.

For fall the orders are up to the present not very large on fleeced hose, but in heavy weight cotton unfleeced goods to retail at 35c. and 50c., fair quantities have been booked. This class of goods seems to be growing every season, while the demand for fleeced goods is falling off.

Trade in gloves is not very rushing. Manufacturers have sent out lots of sample dozens and are now receiving orders on same, but in rather small quantities. Everybody seems to be feeling his way and is trying small lots of this and that, but the large sized stock orders are still missing which were given long before this in previous seasons.

MERINO UNDERWEAR.

Editor Textile World Record:

On pages 68 and 122 of the January number of the Textile World Record are articles on the adulteration of woolen clothing sold in Melbourne, Australia. It may be interesting to your readers to know the effect produced by adulteration of knit goods in a town where underwear has been manufactured for more than fifty years.

I well remember when the cotton was first mixed with wool and the name of the product changed from woolen to merino underwear. The trade thought the merino goods were all wool and they were sold as such for many years, but the manufacturers gradually mixed more of the "Alabama wool" with the pure wool, the jobbers began to smell the rat and finally the shell on the golden egg was broken.

I well remember when one of the largest

buyers from Franklin St., New York, came to the mill to buy goods, and asked me where we got our merino wool, for in those days it was a rather scarce article. I told him from Alabama. He looked astonished, and said he didn't know they kept sheep there, and asked where we kept it and if he could see it. I told him it was in the attic and he could see it if he would promise not to tell any one that we had so large a stock on hand. The dyer had colored some of it beautiful shades and the buyer was astonished to see so much of it in bins and on the floor. It was probably the first colored Alabama wool he ever saw, but he never asked if it was wool or cotton.

Another way of making all wool into merino was as follows: In the first place many of the woolen manufacturers would not believe that the cotton could be used on the woolen cards. They said it would fly all over the room unless the cards were enclosed like a cotton card. When the buyers and jobbers came to the mill to buy goods they had a desire to see the card room and satisfy themselves that there was nothing there but genuine all wool stock.—Old Superintendent.

FINISHING HOSIERY AND FANCY KNIT GOODS.

BY WABASH.

The English process of finishing knit goods is as follows: For socks, golf stockings, caps, etc., dry spun or clean scoured colored yarns are used exclusively. Yarn having a right hand twist gives the most elastic goods and is generally used. The goods are knit with as tight a stitch as seems necessary to produce the best results, and care is taken to keep them clean. In the case of socks and stockings they are then turned off at the toe, and the welts finished, when they are ready for boarding. The best results are obtained with a heavy mill paper board.

For a soft wool finish the goods should now be slightly dampened, and a good way is to place the goods in layers in large baskets, sprinkling them with water at 140° F. When the basket is full cover with a clean cloth and leave them to sweat for about four hours or even longer. They are now ready to put on the boards and may be dried with hot or cold air; the latter gives the best results, but the process is much slower. In the case of striped goods or those made of light colors, care must be taken not to let them lay in the moistening process too long, or they will look blotchy and off color when dry. After drying they are ready for sorting, inspecting, labeling and packing.

This process is known as the dull soft finish, English style. The object is to have the goods look fresh and clean, with that peculiar new look which is not obtained when the goods are fulled.

Another method of finishing knit goods made with a close or tight stitch is called the smooth finish. To insure cleanness and brightness everything is rinsed and soaked in gasolene for two hours, then run through squeeze rolls and rinsed in clean cold water. They are next whizzed as dry as possible, boarded and dried by hot air. It was formerly the custom to press the goods by hand, a damp cloth being laid over them to give the necessary moisture, and this is undoubtedly the best method, but it is slow and requires considerable skill. The best substitute for hand ironing is the laundry ironing and pressing machine. By using steam heat on this machine any required degree of heat can be obtained, and it also has the good feature of not requiring skilled help to run it as it is automatic in action. After ironing and pressing the goods are inspected and are ready for folding, labeling and packing.

As these goods are not washed care must be taken to see that the colors are fast and the material free from oil or grease. Most hosiery manufacturers buy their yarns, but those who make their own and use a wool card should use only pure olive oil, and but little of that, or the goods will come out greasy.

Egyptian cotton, on account of its long, strong and silky staple, is specially adapted for sewing thread, fine underwear and hosiery and other goods requiring smooth finish or high lustre.

AN IMPROVED WEB HOLDER FOR KNITTING MACHINES.

In circular-knitting machines the web-holders are placed in slots in the upper surface of the needle-cylinder, in which slots they are reciprocated. The function of the web-holder is to force the cast-off stitch into the needle-cylinder, and thus take it away from the line of the needles and hold down the goods to prevent them from rising with the needles. If the web-holder extends beyond the inner periphery of the needle-cylinder, the material as it passes from the needles strikes the end

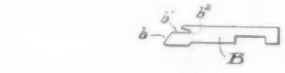


Fig. 1

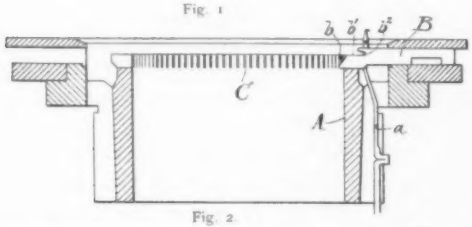


Fig. 2

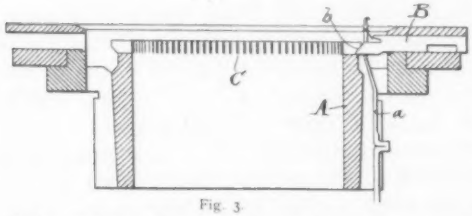


Fig. 3

of the web-holder, which tends to damage the goods. The web-holders, however, must be given a sufficient movement to enable them to perform their proper functions. The difficulty with the present construction of web-holders is that if the forward throw be such as not to project the web-holder beyond the inner periphery of the needle cylinder and yet give sufficient throw to enable the web-holders to perform their function in the rearward movement there is a tendency for the web-holders to pass beyond the outer periphery of the cylinder and on the return movement to strike the cylinder.

An improved web-holder designed to overcome this objection has recently been patented in this country. The forward end of the web-holder is built on an incline or bevel, so that with the necessary throw while in the forward movement the lower end will pass beyond the inner periphery of the cylinder substantially all the remainder of the end will still be within the slot and not touch the goods, while in the rearward movement the lower end will not pass beyond the outer periphery of the needle-cylinder, and thus the web-holder reciprocates or moves with certainty without coming in contact with the goods.

Fig. 1 is a side view of the improved web-holder Fig. 2 is a sectional view of needle-cylinder. showing a needle and the web-holder in its forward position. Fig. 3 is a view similar to Fig. 2, showing the web-holder in the rearward position.

A is the needle-cylinder having the needles, a. In the upper surface of the needle-cylinder are the slots, c, for the web-holder, B. The web-holder, B, is provided with the forward inclined or beveled end, b, terminating in the horizontal ledge, b′, having the slot end, b². The stitch is drawn upon the ledge, b′, when the web-holder is in the position shown in Fig. 2, and is cast therefrom when the web-holder is in the position shown in Fig. 3.

Referring now to Fig. 2, it will be seen that with the improved web-holder the forward throw may be such as to project the lower forward end of the web-holder beyond the inner periphery of the needle-cylinder and yet leave substantially all of the remainder of the end within the slot. In the rearward movement, Fig. 3, while the upper forward end of the web-holder, B, passes beyond the outer periphery of the needle cylinder the lower forward end is still within the slot. On the next forward movement of the web-holder it is properly guided and with no danger of the lower forward end in the rearward movement passing beyond the outer periphery of the needle-cylinder, and thus tending not to return to the slot in the forward movement.

There was no worsted manufacture in the United States until 1842, and as late as 1860 it was practically confined to three New England mills.

It is said that two-fifths of all the colonial wool annually sold at the London auction passes through the combing machines of one Bradford firm.

FANCY KNITTING DESIGNS.

Designs for fancy knitting like that shown at Fig. 133 are produced by tuck presser work on spring needle circular machines. Designing paper, the same as used in designing weave drafts, is used for sketching the pattern. On the design paper, Figs. 134 and 135, each square represents a single loop of plain stitch knitting Fig. 136 C.

The "X X" on the design paper inside the squares, represent a tuck stitch or loop, Fig. 136 B. At Fig. 136 the tuck stitches crosswise at the back of one or more of the plain loops in a straight line—see rows 1, 3, 5, 7, 9 and 11, Fig. 136. Fig. 133 is an illustration of the knitted fabric corresponding to

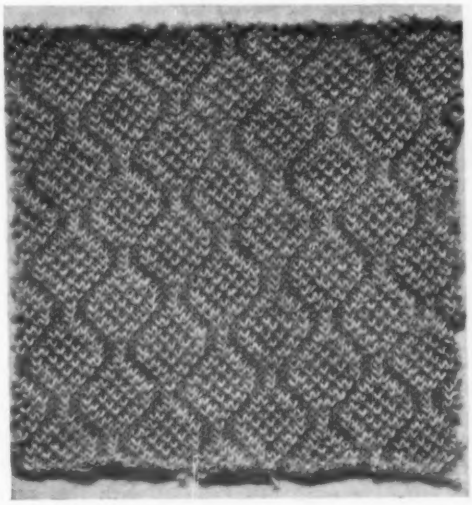


FIG. 133.

the design, Fig. 134, and to the loops as shown on Fig. 136.

These designs can be made with a single colored thread and the tuck stitches will show the pattern, but in order to bring the pattern out more prominently, two contrasting colors are used, as black and blue, red and white, etc.

As this design is made with 12 feeds on the machine, 6 plain presser feeds, and 6 tuck presser feeds, a third or fourth colored thread could be used on any of the feeds as desired, which would vary the effect of the design.

To produce fancy patterns in knitting the design is first sketched on the paper as shown in Fig. 134. We next ascertain at what square in the design the pattern begins to repeat.

At Fig. 134, at A, in the left hand corner

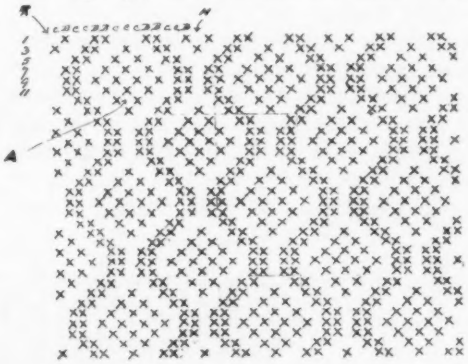


FIG. 134.

at the top, the first square on the first row of the design is a plain stitch C, the next B a tuck stitch, the next two, C C, are plain the next two B B are tuck, and so on.

Counting the rows downwards from A at the top to the square marked A also, on the 7th row of squares, and the 8th square from the left, and commencing at the square marked by the arrow point, continuing along

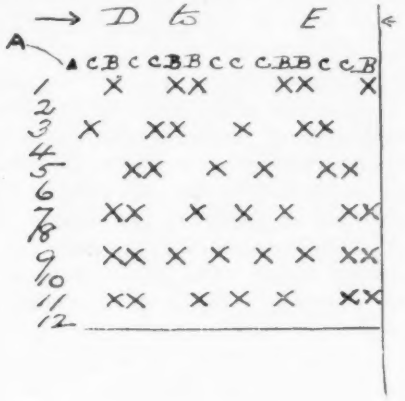


FIG. 135.

to the right on that row, it will be seen the design repeats itself as at the beginning.

Continuing to count downwards from this second starting point, to the 7th row, and 8th square from the left of the first 8th square, the pattern again repeats itself.

Counting again horizontally from first square A at the top to square marked H, 14 squares, the pattern begins to repeat in that direction. Thus we find that the pattern consists of 14 stitches in width by 6 courses deep, $14 \times 6 = 84$ stitches to complete the design.

To produce this design with only one tuck presser would require 84 teeth or cuts, and as the repetition of the design is 7 stitches to the right, the number of needles in the cylinder would have to be divisible by 84 with a remainder of 7 or 77 needles. 77 is equivalent to 7 less than the divisor, and 7 is one-

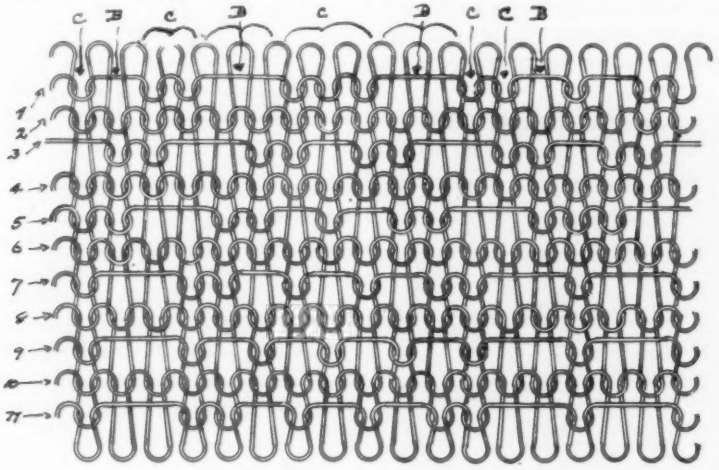


FIG. 136.

half of 14, which is the width of the design. Either number of needles would produce it.

Each alternate feed or course of stitches is plain, which enables the tuck stitches to be cast off, but in sketching the design, Fig. 134, only the courses for the tuck needle pressers are shown. The whole design when knitted, therefore, will be 12 courses deep and 14 stitches wide, as shown at Fig. 136, those marked 2, 4, 6, 8, 10 being the alternate courses of all plain stitches.

The tuck pressers produce both plain and tuck stitches as seen in Fig. 136, courses 1, 3, 5, 7, 9 and 11. Where the tuck stitches are formed by not being pressed off by the tuck presser, but are held until the succeeding plain presser feed is reached, an elongation of the stitches thus held is caused. Where the yarn crosses in a straight line, the previous plain loops being held, are drawn down to the next succeeding course of plain loops. The result of the tuck stitches crossing the others at the back is to leave a loose thread or loop. It is therefore not desirable, when designing a pattern, to have any more than 3 or 4 tuck stitches occur together, as the length of the loose thread would be increased.

Having ascertained the number of stitches required to complete the design, which in this case is 84, the next thing is to have the tuck pressers made with 84 teeth or cuts in them, Figs. 137, 138, 139, 140, 141, 142, allowing one tuck presser for every tuck course in depth, which in this instance is 6. The cuts for each correspond with the section of the design, Fig. 135, starting at A from D to E.

The small indentations or cuts, C, on Figs 137 to 142 represent the plain stitches, and the deep cuts, B, the tuck stitches.

Where the deep cuts, B, come in contact with the needles, the stitches are not pressed off, but remain on the needles until the succeeding plain presser feed is reached, when it presses from both. The tuck stitch then becomes the straight loop across the previous plain course loops.

When the small cuts, C, of the tuck pressers come in contact with the beards of the needles, they close them and thus produce plain stitches. The tuck pressers thus make

both plain and tuck stitches. The plain presser feed presses off every loop.

Taking the section of the design, Fig. 135, and starting at square, A, No, 1, at the top, and reading it off for the cutting of the tuck presser, we have one plain, one tuck, two plain, two tuck, three plain, two tuck, two plain, one tuck, or 14 in all, as shown on Fig. 134 from A to H, from which point the pattern is repeated on this row. No. 1, Fig. 137, from D to E.

On the 3rd course is one tuck, two plain, two tuck, two plain, one tuck, two plain, two tuck, and two plain. No. 3, Fig. 138, from D to E.

On the 5th course, two plain, two tuck, two plain, one tuck, one plain, one tuck, two plain, two tuck, and one plain. No. 5, Fig. 139.

On the 7th course, one plain, two tuck, two plain, one tuck, one plain, one tuck, one plain, one tuck, two plain and two tuck. No. 7, Fig. 140.

On the 9th course, one plain, two tuck, one plain, one tuck, one plain, one tuck, one plain, one tuck, one plain, and two tucks. No. 9, Fig. 141.

On the 11th course, one plain, two tuck, two plain, one tuck, one plain, one tuck, one plain, one tuck, two plain and two tuck, No. 11, Fig. 142 corresponds.

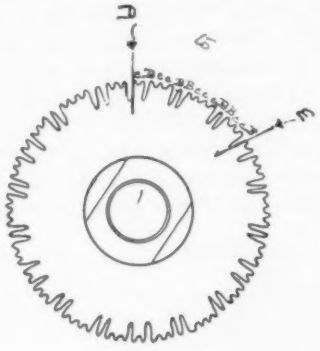


FIG. 137.

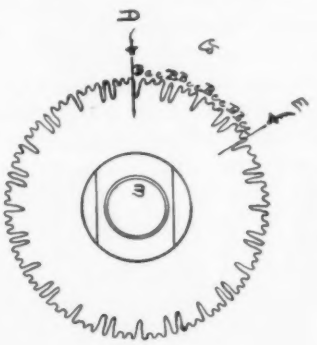


FIG. 138.

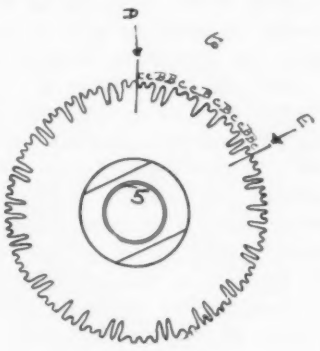


FIG. 139.

Fig. 134 of the design shows that after 6 courses of tuck pressers (or 12 courses of knitting as shown in Figs. 135 and 136), the design begins to repeat as at the beginning, at the 8th square from the left.

This design is shown as being produced with 6 tuck pressers of 84 cuts each, but the cuts are repeated on the pressers after each 14 cuts, therefore in making this design with this number of tuck pressers or feeds, it is not necessary that the number of needles shall divide by 84 and leave a remainder of 7 over or 7 less, as would be required for only one tuck presser. It is only necessary that they shall divide by 14 and leave a remainder of 7 needles. As there is a remainder of 7 needles over in the cylinder, on

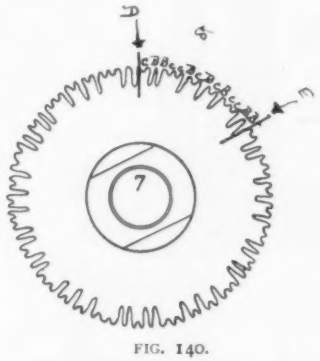


FIG. 140.

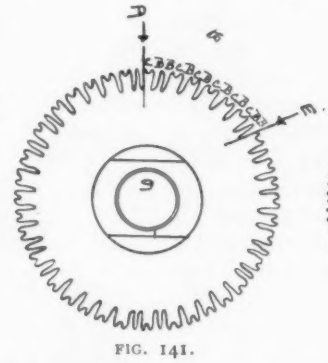


FIG. 141.

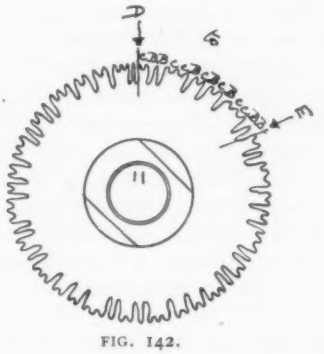


FIG. 142.

the 2nd and every succeeding revolution of the machine, the position of the tuck pressers will be changed 7 needles to the right or left.

In setting the tuck pressers on the machine, they must follow each other in succession from 1 to 11 as marked. Starting from any one needle, each presser at the starting point, D, must be set on the same needle, in order to work in unison and produce the design as illustrated in Fig. 133. If this were not done, the position of the loops would come different, and a mixture of plain and tuck stitches would result, without any particular design or pattern. In making this design with only one tuck presser, the latter would have to be cut differently than when made with 6 as shown. To produce it with one tuck presser, take the section, Fig. 135, and starting at A, read from D to E on course No. 1. Then continue in succession with rows No. 3, 5, 7, 9, and 11, all around the presser, thus the whole design would be contained in one presser.

There being only one tuck presser, it could be started at any given needle, and on the 2nd revolution of the machine, there being 7 needles over, the 2nd or 3d course of tuck stitches would come under the first course, 7 stitches to the right or left, and so on for each succeeding course.

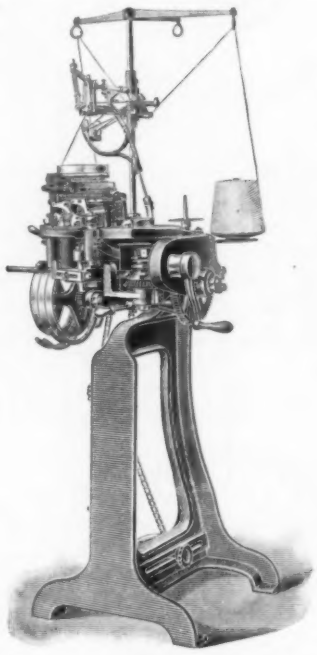
Fig. 136 is an enlarged sketch of the stitches as per the illustration, Fig. 133. It is drawn from the section of the design, Fig. 135; letters and figures all correspond. Figs. 137 to 142 inclusive are top views of the 6 tuck pressers, showing how they are to be cut. D to E on each of them correspond with the squares of the design D to E on Fig. 135. The numbers in centre correspond to same numbers at left of rows on Fig. 135.

In religious matters the Paisley weavers had ways of their own. They were in the main a devout and serious class and much given to theological discussions. A weaver of this very solemn and serious order was groaning over a bad web that sorely tried his patience, and was sympathized with by a neighbor, who remarked: "Puir John, ye ken he daurna swear," which would no doubt have relieved his feelings.—Matthew Blair, in "The Paisley Shawl."

THE "INVINCIBLE" KNITTING MACHINES.

The illustrations show the latest models of the Invincible knitting machines, built by the E. Jenckes Manufacturing Co., whose main office and factory are at Pawtucket, R. I. In order to meet all the different conditions desired by their customers, the Invincible machine is now furnished either as a bench machine or on a base, as may be desired.

The Philadelphia office of this concern has hitherto been in the Bourse, but it has been obliged to remove on account of rapidly increasing business, to larger quarters where

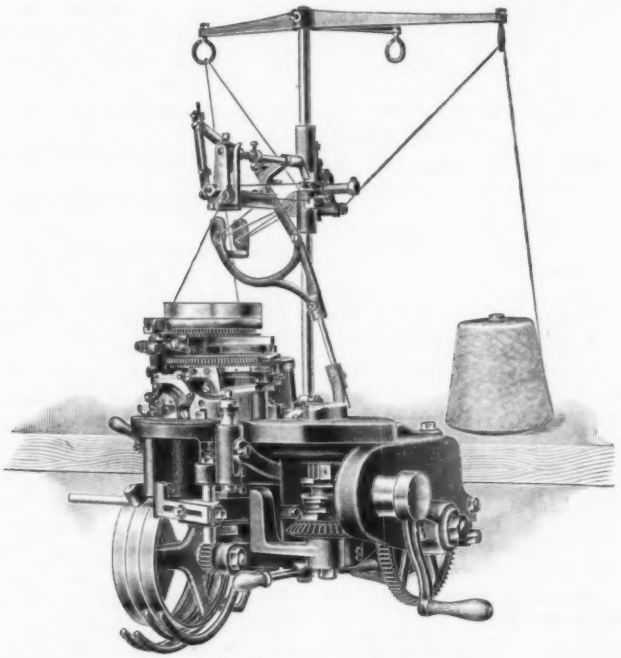


INVINCIBLE KNITTING MACHINE, MOUNTED ON BASE.

they have much better show room accommodations, in the Schenck Building, Sixth and Arch Sts., with entrance at 101 North Sixth St. They have there Invincible machines of various gauges in operation and ready to show at all times. There are machines with attachments for making high spliced heel and double sole goods, also yarn changing, striping, plating and white foot attachments. This new office, in the centre of the knitting

machinery district, will prove of special convenience to Pennsylvania and Southern trade.

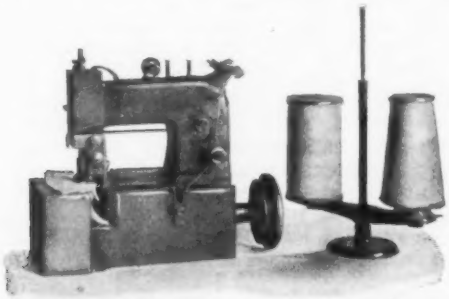
New York and Brooklyn, is president, and S. Banner, treasurer. Before this company was formed, these gentlemen carefully investi-



THE INVINCIBLE KNITTER ON A BENCH.

A NEW TRIMMIN AND SEAMING MACHINE.

The illustration shows a new machine for trimming and seaming knit goods in one operation, which is being placed on the market by the American Overedging & Seaming Machine Co., 543 East 116th St., New York.



A SEAMING AND TRIMMING MACHINE.

This is a new company, of which Julius Kayser, the large knit goods manufacturer of gated the merits of the machine in operation in their factories. It is adapted for the purpose of seaming and covering the edges of cut underwear and sweaters, and is claimed to be very simple and easy to operate.

The same concern also builds a new high speed seaming machine for full fashioned underwear and sweaters, which produces a very flat seam, and it is claimed that the very loosest kind of knit woolen fabric can be sewed with it, and will lie perfectly straight without having that ruffled appearance which gives manufacturers of sweaters so much trouble.

Full information about these machines and samples of the work produced may be had upon application to the company.

Sewing silk is numbered irregularly by letters,—OOO, OO, O, A, B, C, D, E, EE, F, FF, G. The yards in one ounce for the respective letters are 2000, 1600, 1300, 1000, 850, 650, 550, 400, 330, 262, 212, 125.

Gauge of Knit Goods.

Editor Textile World Record:

On page 144 of the December issue under the head of "Knit Goods Terms" it is stated that the gauge is determined by the number of meshes or wales to the inch of fabric. Is this not wrong? We understand that the gauge is determined by one-half the number of needles in three inches on the knitting machine. Gauge (532).

The term gauge is used to determine both the set of the wales in the knitted fabric and the set of the needles in the cylinder.

In the former sense it indicates the number of wales per inch, thus a 16-gauge fabric has 16 ribs or wales per inch.

As applied to the knitting cylinder it indicates one-half the number of needles in three inches of the circumference of a spring needle circular machine. For example, a 16-gauge needle cylinder with leaded needles will have 16 leads in 3 inches measured on the circumference. Each lead containing two needles = 32 needles. 1/2 of 32 = 16, or 16 gauge. The same rule applies to trick needle circular machines and also to flat spring needle machines, only the gauge is determined by so many needles to one inch. For example, 16 needles in one inch = 48 needles in 3 inches. 1/2 of 48 = 24, or 24 gauge. Or again, 10 2/3 needles in one inch = 32 needles in 3 inches: 1/2 of 32 = 16, or 16 gauge.

A piece of knitted fabric having 16 wales or ribs to the inch would be a 16-gauge fabric although it would not follow that it had been knit on a 16-gauge needle cylinder for the reasons as fully given in my article on "Analysis of Knitted Fabrics," page 132 of the October, 1904, issue. Still it would be equal to a 16-gauge fabric so far as the number of wales to the inch is concerned.

The second term applies to the determining of the gauge of the knitting machine, and the compiler of "Knit Goods Terms" should have included both definitions under the same heading.

Lafayette.

Market Price for Hosiery.

Editor Textile World Record:

What are manufacturers getting for cotton half hose, white feet, black legs, 4 inches diameter, 160 needle, made of 13's cotton yarn and weighing from 1 1/4 to 1 1/2 pounds per dozen?

Witte (527).

In regard to the price of men's black half hose with white feet, the best prices that I know of on 160 needle, 4 inch leg goods to weigh 1 4/16 lbs. is 85c.; 1 3/16 lbs., 82 1/2c.; 1 6/16 lbs., 95c. These are supposed to be made from 13's yarn, but we have not found many selling agents who possess knowledge of exactly the size of yarns used in lines of goods they handle.

In order to ascertain definitely, it will be necessary to write the manufacturers direct and few of them are willing to answer such questions. The popular retail prices on such goods is from 10c. a pair to two pairs for 25c. Fillmore.

Manufacturing Cost of Hosiery.

Editor Textile World Record:

Please let me know the manufacturing cost of ladies' seamless hose, men's socks and misses' ribbed hose, 108 needle machine, made of good strong Southern yarn. Dixie (528).

Without a better understanding of the question it will be impossible to give any information that will be of real value. Nothing is said about the gauge, weight or quality of the ladies' hose, and as for the misses' ribbed hose made on 108 needle machine, I am at a loss to know what Dixie means. The term, 108 needle gauge, as it is commonly used means that the diameter of the cylinder is to be 3 3/4 inches, which I consider altogether too coarse for anything in the line of misses' hose. Men's half hose made on such a machine from 5 or 6 cotton yarn would weigh about two pounds, and the cost for making would be about 30 cents per dozen. This does not include cost of material, waste, mill expenses, etc., which necessarily vary with the locality, management, etc.

Foreman.

Recent Knitting Patents.

KNITTING MACHINE. 781,253. George D. Whitcomb, Glendora, California.

KNITTING MACHINE, Needle and Lever for Holding Same. 781,654. Harry A. Houseman, Philadelphia, Pa., assignor to Standard Machine Co., Philadelphia, Pa.

KNITTING MACHINE Needle Protector. 783,005. Frank B. Wildman, Norristown, Pa.

KNITTING MACHINE. Rib. 783,155. Harry Swinglehurst, Philadelphia, Pa., assignor to Robert W. Scott and Louis N. D. Williams.

KNITTING MACHINE. Straight. 782,480. Albin Benndorf, Zeulenroda, Germany.

KNITTING MACHINE Take-Up Mechanism. 783,144. Robert W. Scott, Philadelphia, Pa., assignor of one-half to Louis N. D. Williams.

KNITTING MACHINE Web Holder. Circular. Harry A. Houseman, Philadelphia, Pa., assignor to Standard Machine Co., Philadelphia, Pa.

KNIT.

New Mills.

*Georgia, Athens. The Athens Knitting Mills, recently established here by H. Smith, will be equipped with 25 knitting machines for making mixed colored hosiery. Plant will have capacity of 300 dozen pairs a day.

Massachusetts, Boston. The Anchor Knitting Company has been incorporated with capital stock of $25,000. John L. Allen is president of the company, and Van Courtland Lawrence, 831 Tremont Building, treasurer. They will not build a mill at present but will have the goods made by contract.

Montana, Helena. A new company has been started here as the Montana Knitting Mills, with H. S. Benson, president and treasurer; E. B. Morehead, secretary and J. H. Morehead, manager. They expect to begin operations in March, employing four or five people at start.

New Jersey, West Hoboken. The Augstein-Schauzer Co. have started a knitting mill in this town. They manufacture all kinds of fancy knit goods on 12 knitters, 4 sewing machines, all run by electricity. Will sell goods through the main office at 142-144 Greene St., N. Y., where the superintendent and buyer, S. Augstein, is located.

*New York, Little Falls. The Rex Knitting Co., recently organized to operate the plant formerly run by the Titus Sheard Co., manufactures wool sweaters. Equipment comprises 7 sets cards, 2,000 spindles and 30 latch needle knitting machines. Also dye house. Goods are sold through Bruhn, Webb & Alford, New York.

New York, New York City. The Enterprise Knitting Works has been started up at 161 E. 106th St., with Joseph Markovitz as the manager and buyer. Sweaters, blouses, gloves and fancy knit goods will be manufactured, three machines having been purchased from the Grossner Machine Co., and others to follow. The goods will be sold direct.

*New York, New York. The Metropolitan Knitting Mills, recently reported incorporated with capital stock of $10,000, is a consolidation of the Manhattan Knitting Works, the Manhattan Knitting Mills and the Prudential Knitting Mills. Alex. Silverberg is president of the company, B. Friedman, vice-president, J. J. Lippmann, treasurer, and S. D. Selikowitz, secretary. Ladies', men's and boys' sweaters and ladies' blouses and shawls, worsted hosiery and sporting hosiery are made. Plant is equipped with 50 knitting and 25 sewing machines. Goods are sold direct.

*New York, Niagara Falls. Operations have been started by the Visor Knitting Company, recently incorporated with capital stock of $40,000, making the Visor driving hood and muffler and toques. Wm. Gorman, London, Ont., is president of the company, and H. W. Scott, Niagara Falls, treasurer and superintendent. They operate 7 knitting and 2 sewing machines, using electricity. Goods are sold direct.

*New York, Troy. The Barnet Textile Co., recently reported incorporated to manufacture stockinette, jersey, fleece and slipper cloth, succeeds the Commercial Knitting Mills Company. Gates Barnet is president of the new company, Jesse Barnet, vice-president, Jonas M. Barnet, treasurer, and G. Garfield Barnet, secretary. The plant is equipped with 11 sets cards and 80 knitting machines.

New York, Utica. The Argo Knitting Company's plant has been purchased by G. H. Spitzli and will be operated as the Spitzli Hosiery Co., Mr. Spitzli, proprietor. Infants' hosiery in worsted and mercerized is made. Plant is equipped at present with 10 spring needle knitting and 2 sewing machines and operated by steam. Goods are sold direct.

*North Carolina, High Point. The Centaur Knitting Company is now installing the machinery equipment. This concern, capitalized at $50,000, will manufacture 176 needle ladies' seamless hosiery. Plant will be equipped with 42 full automatic knitting machines and 2 sewing machines, using electricity. Goods are to be dyed and finished at the mill, and sold through Steele & Caruthers, New York. Operations will start about March 1st. A new building, 100 by 90 feet, two stories, has been built.

*North Carolina, Hillsboro. Work is being pushed to completion on the Bellevue Manufacturing Company's new plant. It is expected to have the plant in operation about May, making children's and misses' hosiery. They will instal 2,200 spindles for making yarns.

*North Carolina, Winston-Salem. It is expected that the main structure of the Wachovia Knitting Company's new plant will be ready for installation of the machinery in about two weeks. They will install 15 knitting and 12 sewing machines.

*Pennsylvania, Philadelphia. Eddishaw Bros. have leased quarters at Germantown and are now installing the machinery. They will operate 25 National Automatic knitter machines on ladies' and children's hosiery. Harry Eddishaw is manager of the plant. Operations are to begin early in February.

Pennsylvania, Philadelphia. Mr. J. Goldstein, 7th and Master Sts., at one time connected with the Franklin Knitting Co., which operated a plant at Franklin St. and Girard Ave., several years ago, has in contemplation the starting of a knitting plant with a production of about 100 doz. per day. The equipment has not yet been purchased.

*Pennsylvania, Philadelphia. Lessig & Harrison who recently started in the knitting business at 1907 North 6th St., in the quarters formerly occupied by William Wrightson, have in operation 32 knitters, which they are running on fancy half hose which they have sold up to date. Mr. W. J. Harrison, who superintends the plant, was formerly connected with Thos. Buck in the same capacity. They are now in the market for two sewing machines. The plant is run by steam and they use 10's to 40's cotton yarn.

*South Carolina, Westminster. The new building for the Westminster Knitting Mills is nearly completed. The machinery equipment (which has been ordered) will consist of 60 knitting machines, 10 ribbers and 15 loopers, for making 84 needle half-hose in mixtures.

Enlargements and Improvements.

*Alabama, Gadsden. A building, 40 by 40 feet, is under construction for the Adams Knitting Mill and will be equipped for a bleach house.

Massachusetts, Boston. The Boston Knitting Mills, formerly located at 76 Summer street, are about to resume operations at 1160 Washington street, under management of Joseph Lewenburg. The new plant will occupy about 2,500 square feet of floor space and will have capacity of about three times the former mill. Ladies', men's and children's sweaters and children's hosiery is made. Operate 10 Lamb and 6 German knitting machines, 20 sewing machines and 8 hosiery machines.

*Massachusetts, Pittsfield. The Musgrove Knitting Company, which recently moved into the Steam Power Building, has started operations on full time. Although operations have begun with same number of machines as in the old plant, they contemplate installing some new machines.

Michigan, Bay City. At annual meeting of the stockholders of the Bay City Knitting Company, held recently, it was voted to change the name to the World's Star Knitting Company and increase the capital stock to $200,000. H. B. Smith was elected president; M. H. Smith, vice-president; D. L. Galbraith, secretary, treasurer and general manager, and C. A. Galbraith, superintendent. Work will start at once on erection of an addition to the present mill, 50 by 180 feet, three stories and basement, also power house 48 by 40 feet. They propose doubling the hosiery plant and adding equipment for making underwear.

New Jersey, Dover. Plans are being drawn for an addition to Paul Guenther & Co.'s silk hosiery mill. A building about 100 by 40 feet, two stories, is to be built.

New Jersey, Haddonfield. The Estaugh Knitting Mills, manufacturers of ladies' underwear, are increasing their capacity by the addition of a number of body machines of Nye & Tredick make.

New Jersey, Newark. The D. E. Knit Goods Co. has been incorporated with capital stock of $25,000 and will continue the plant of same name now located at that place. William Brugger and Max Guenther are among the incorporators.

New Jersey, Newark. The Blauvelt Knitting Co. has been incorporated with capital stock of $75,000. Chas. H. Bunn, Stephen S. Tallman and Edward L. Blauvelt are among the incorporators. This is an incorporation of the Blauvelt Knitting Co., operating a mill here.

New York, Amsterdam. Gardiner & Warring have recently installed new machinery in the plant, greatly increasing the capacity.

New York, Oswego. The Ontario Knitting Company is building a new addition to the mill.

New York, Troy. The Wayside Knitting Co. has purchased some of the W. H. Rowe Knitting Co.'s machinery equipment.

*New York, Utica. Work is under way on erection of the new four-story warehouse for the Utica Knitting Co.

*North Carolina, Albemarle. The Wiscasset Mills Co., J. W. Cannon, president and J. F. Cannon, treasurer, will start work at once on the erection of the new spinning mill. They propose having same completed by July. A dye house will be erected also.

North Carolina, Elizabeth City. The Elizabeth City Hosiery Company contemplates building a yarn spinning plant to supply their mill and also for the trade. They are endeavoring to interest outside capital in the new project.

Ohio, Cleveland. The Standard Knitting Company has increased the capital stock from $25,000 to $50,000.

Pennsylvania, Pottsville. John H. Kaiser is now operating the plant formerly run by James Aikman, Jr., and is making ladies' seamless cotton hosiery. Plant is equipped with 12 knitting machines. Mr. Kaiser contemplates installing additional machinery.

Pennsylvania, Reading. The Rainbow Hosiery Co., 111 Lemon St., manufacturers of half hose, have recently purchased the entire equipment of the Consolidated Hosiery Co., Philadelphia, consisting of 70 knitting machines, which they are removing to Reading to be run in conjunction with those already in the plant.

Pennsylvania, Schuylkill Haven. A new knitting mill is to be erected by J. C. Lautenbacher. The output of the present mill will be doubled in the new plant.

*South Carolina, Jonesville. The Jonesville Manufacturing Company, operating 7,000 ring spindles and 200 knitting machines, will install 5,000 mule spindles and looms to take care of the present equipment of spindles.

Tennessee, Sweetwater. The Sweetwater Hosiery Mills have increased the capital stock to $50,000.

Wisconsin, Milwaukee. Victor Montwid & Son expect to remove their plant to larger quarters by March 1st.

Wisconsin, Milwaukee. The M. Friedlander Knitting Company has been incorporated with capital stock of $50,000, to continue the business of which M. Friedlander was formerly sole proprietor. The incorporators are Morris, Alexander J. and Cecelia Friedlander.

Wisconsin, Two Rivers. The Zulu Knitting Company has been incorporated with capital stock of $200,000. They will continue the plant operated as the Zulu Hosiery Mill.

Mills Starting Up.

*New York, Athens. Operations have been resumed by the Athens Knitting Co. and it is thought that within a few weeks will be running in full. A number of New York stockholders have been elected directors and the plant will undoubtedly get back to its former standing.

New York. Cohoes. Operations have been resumed in full in the Parsons Manufacturing Company's plant.

*Pennsylvania, Reading. Operations have begun in the new plant of the Gem Knitting Mills Co.

*Tennessee, Chattanooga. The Davis Hosiery Mills are now in full operation. The plant was first started some two months ago, the force being gradually increased. The mill is 200 by 60 feet, two stories, and makes misses' and children's hosiery.

Facts and Gossip.

Connecticut, Addison. The Glastonbury Knitting Company is operating Mills No. 1 and 3 with night and day force to keep up with orders.

Connecticut, Hartford. The Reliable Manufacturing Company has been incorporated with a capital stock of $10,000 by W. J. Roberts (New Bedford), E. W. Newton and James Govan (Hartford). This mill was formerly located in New Bedford, but was removed here about two months ago.

Massachusetts, Cambridge. The Oakes Knitting Mills have purchased a mill in West Roxbury and propose moving there within the next two months. They contemplate increasing the machinery in the near future, but have as yet reached no definite decision regarding same.

*Massachusetts, Worcester. It is stated that an inventory of the Aetna Knitting Company's business is being taken and within a short time report will be made to the creditors. It is not yet known whether the assignees will sell the plant out to new parties or whether the people who have been running the company may be able to interest capital in a re-organization of its affairs.

Mississippi, Tupelo. It is reported that a new knitting mill, capitalized at $50,000, is to be established here and that the capital stock has all been subscribed.

Missouri, Kansas City. G. Frank Lidy, of 210 W. 11th St., is interested in establishing a knitting plant of about 30 machines.

*New York, Greenwich. The Jesse V. Palmer Knitting Company has been organized with capital stock of $50,000 by Jesse V. Palmer, LeRoy Thompson, John A. McDougall (Greenwich) and Josept A. Leggett and William C. Geer (Troy.) They have installed 51 new knitting machines in the plant which they have taken and will employ more than 100 people.

New York, Mechanicsville. The machinery in the plant formerly operated by Newland & Neilson, is being sold. The plant has not been running for some time.

New York, West Sand Lake. The McLaren Knitting Co. has closed the plant for purpose of making changes in machinery to make another class of goods. More help will be employed.

*North Carolina, Durham. Dr. E. H. Bowling and J. E. Bowling have purchased the controlling interest in the Stone Hosiery Company, which has been recently incorporated with capital stock of $125,000. A number of new machines will be put in.

North Carolina, Sylva. J. R. Love is reported as contemplating erection of a knitting mill at this place.

Ohio, Bowling Green. The Superior Underwear Company has been incorporated with capital stock of $10,000. This is an incorporation of company operating plant here under above name.

Ohio, Cincinnati. The Adler Underwear and Hosiery Mfg. Co. has been incorporated with capital stock of $255,000 ($100,000 preferred, remainder common), to take over business of Adler & Co.

*Pennsylvania, Philadelphia. Messrs. Aucott and Locke have their plant, manufacturing ladies' cotton and lisle hose and infants' cotton, merino and worsted hosiery, in full operation. They operate 90 knitting machines, 5 welters and 8 loopers. Goods are sold direct and through commission houses. They report business as very brisk.

Pennsylvania, Port Carbon. Several months ago H. L. Miller started a knitting plant at this place, making ladies' cotton underwear. Our representative reports that great activity prevails in the various departments.

Pennsylvania, Pottstown. The Pottstown Hosiery Mills, Inc., have succeeded to the business of Messrs. Fritz & Krause. The new company has a capital of $200,000 and continues the manufacture of men's, women's and misses' cotton hosiery on 148 knitters, which they finish and sell direct.

Personals.

Burton B. LaFleur, Manchester, N. H., is at present employed by the Acme Knitting Mills, Brooklyn, N. Y., in charge of the sweater and jacket machine fixing.

T. L. Upton, manager of the Alden Knitting Mills, has signed a contract, effective February 1, to manage the Columbus (Miss.) Hosiery Company at Columbus, Miss. He will remain as manager of the Alden Mills also, making a trip once a month to Columbus and will continue to reside in Paducah.

A. W. Walkden, who for a number of years made his headquarters in the Philadelphia office of Messrs. Scott Williams, builders of knitting machinery, and who has for some time past been in charge of their office in Utica, is now back again at Philadelphia, Mr. Ainsworth, the former Utica manager, being again in charge of that office.

George Davidson, Cleveland, O., has accepted the position of superintendent with the Depew Knitting Mills at Buffalo, N. Y.

John Splan, who comes from Waterford, N. Y., has succeeded Walter Riley as overseer of carding for the Alpha Knitting Co., Schenectady, N. Y.

Arthur Fenton, for the past three years with Thompson Bros., Milroy, Pa., succeeds his brother, T. W. Fenton, as overseer of dyeing at the Samuel Fitch Mfg. Co., Thornton, R. I.

William W. Bennett, for the past four years with the Phenix Spinning Co., Providence, R. I., is the new superintendent for the Samuel Fitch Mfg. Co., Thornton, R. I. He succeeds F. W. Perkins, who resigned as treasurer and superintendent. Jesse P. Eddy, Jr., is treasurer now.

Thomas McClintock of Cohoes, N. Y., has accepted a position as boss dyer and bleacher with the Ford Mfg. Co., Waterford, N. Y.

New Machinery and Processes.

This department is designed to present from month to month a brief mention of new machinery, devices, and processes being brought out in this country and abroad, that are of interest to textile manufacturers. It is not a list of patents, but of improvements coming on the market. The idea being to present to our readers a systematic monthly record of new machinery, etc., of interest to textile mill men.

We invite machine builders and others to send us such information for this department.

Blower for Raw Stock. New York Blower Co., Chicago, Ill., has recently placed on the market a raw stock blower embodying several new features. A description is given in another part of this issue.

Electric Neutralizer. The Chapman Neutralizer Co., Portland, Me., are placing on the market a device for neutralizing the static electricity in textile mills, particularly adapted at this time to carding machines.

Circular for Heilmann Comb. Elsassischen Maschinenbau-Gesellschaft, Mulhause, Germany. An improved combing cylinder for the Heilmann comb. A part of the needles swing on pivots instead of being solidly fixed in the cylinder. It is claimed that these movable needles enable a wider range of material to be combed with the same machine.

Jacquard Machine. Hermann Schroers, Crefeld, Germany, has recently brought out a new jacquard machine which is said to embody many improvements.

Cloth Printing Machine. Franz Zimmers Maschinenfabrik, Warnsdorf, Austria. A new four-roll cloth printing machine for widths up to 64 inches. This new machine represents the results of many years' experience in building cloth printing machines. Three of them have been installed in Wien and are in successful operation. Among the advantages claimed for it is uniformity of pressure throughout the piece.

Dyeing Machine. Emil Bocks, Unter Barmen, Germany. A dyeing machine for yarn and raw stock. It is operated on the circular principle in such a way that the liquor is forced through the material in four directions.

Braiding Machine. Gustav Krenzler, Unter Barmen, Germany, recently brought out an improved braiding machine which is capable of turning out a large production on a wide range of work.

Spooler Spindle. G. F. Grosser, Markersdorf, Germany. An improved spooler spindle by which paper cops are held firmly in position while yarn is being spooled from them.

Cloth Expander. Pickup & Knowles, Manchester, England, have recently placed on the market an improved cloth expander for which they claim great advantages. It consists of three steel bars carried by adjustable brackets. These bars are covered with rubber and the expansion is regulated by a curvature of the bars.

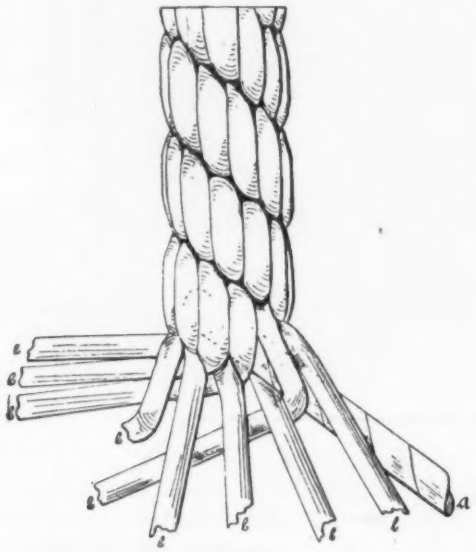
Double Loom. E. Ohlischlaeger & Cie. Viersen, Germany. A loom for weaving two widths of cloth, each with two solid selvages. An extra picking motion is in the centre of the loom. The centre picker stick throws a shuttle alternately to right and left for both widths.

Conditioning Apparatus. Societa Anonima Co-operativa per la Stragionatura e l'Assagio delle Sete, Milan, Italy. An improved conditioning apparatus by which the hot air is made to pass more uniformly through the material. It is stated that with the old apparatus 75 minutes are required to bring the material to a constant weight, while the same result is obtained in 10 minutes with the new machine, the work, moreover, being much better.

Mill Hoist. Baldwin & Heap, Burnley, England, have recently placed on the market a hoist specially adapted for mills and warehouses where bales and boxes are to be handled.

A BRAIDED ROPE.

The novel method of making rope shown in the accompanying illustration was recently invented in Germany. This rope is made by a combination of twisting and braiding, and consists of a coarse strand, a, around which nine finer strands, b, are so braided and twisted that the heavy strand, a, forms a spiral covered with the braided strands.



A BRAIDED ROPE.

The core strand, a, is completely covered and its presence is indicated only by the swelling of the outer covering. The outside strands, b, lie parallel with the axis of the rope and thus friction and wear are reduced to a minimum. On account of this construction the rope is very elastic, pliable, soft, as well as exceedingly durable. It is very efficient for power transmission as it almost completely fills the groove of the pulley.—Oesterrich's Wollen und Leinen Industrie.

The first appearance of the cotton boll weevil in the United States was at Brownsville, Texas, in 1892, where it had advanced from the state of Coahuila in Mexico. In the latter state the cultivation of cotton was abandoned from 1856 to 1862 on account of the ravages of the insect.

BLOWING LOOSE STOCK.

During the last ten years the problem of transporting loose stock from one part of the mill to another has been greatly simplified by the use of blowers which force the material through pipes by means of an air blast. This system is available not only for dry but also for wet stock. It is possible to take wet wool from the squeeze rolls of the washer or after it has been extracted, and blow it a long distance in any direction, horizontally, upward, downward, or around corners at any angle. Mixing pickers can be directly connected with the suction end of the blower and the stock as it comes out sucked to the fan and then blown into bins in any part of the mill.

The advantages of this system of transporting stock are well illustrated by the picking room shown in the accompanying engraving, Fig. 1. This picking room supplied 30 sets of woolen cards and before the application of the blower system about to be described the room was taxed to its utmost capacity to supply 18,000 pounds of picked stock per week. After the blower system was installed, 30,000 pounds per week was easily delivered to the cards and at a saving of $100 on the cost of labor per week.

Beginning with the first room in the foreground there were five compartments as follows: 1, mixing picker; 2, burr picker; 3, mixing picker; 4, burr picker; 5, mixing picker. In this way the stock from each burr picker could be delivered to either of two mixing rooms, while the middle mixing room, the largest of the three, was supplied by two burr pickers. The delivery spout of each mixing picker was connected with a pipe that ran under the floor to the suction end of the fan at the farther end of the room. By means of a wooden valve at each mixing picker the stock could be blown either into the room to be carried back and picked again, or into the pipe and sucked to the fan, by which it was blown three stories above to the card room. Here by an ingenious plan the stock could be automatically blown into any one of fifteen bins arranged like the stalls in a railroad round house, as shown at Fig. 2. A speaking tube between the store

FIG. 1.

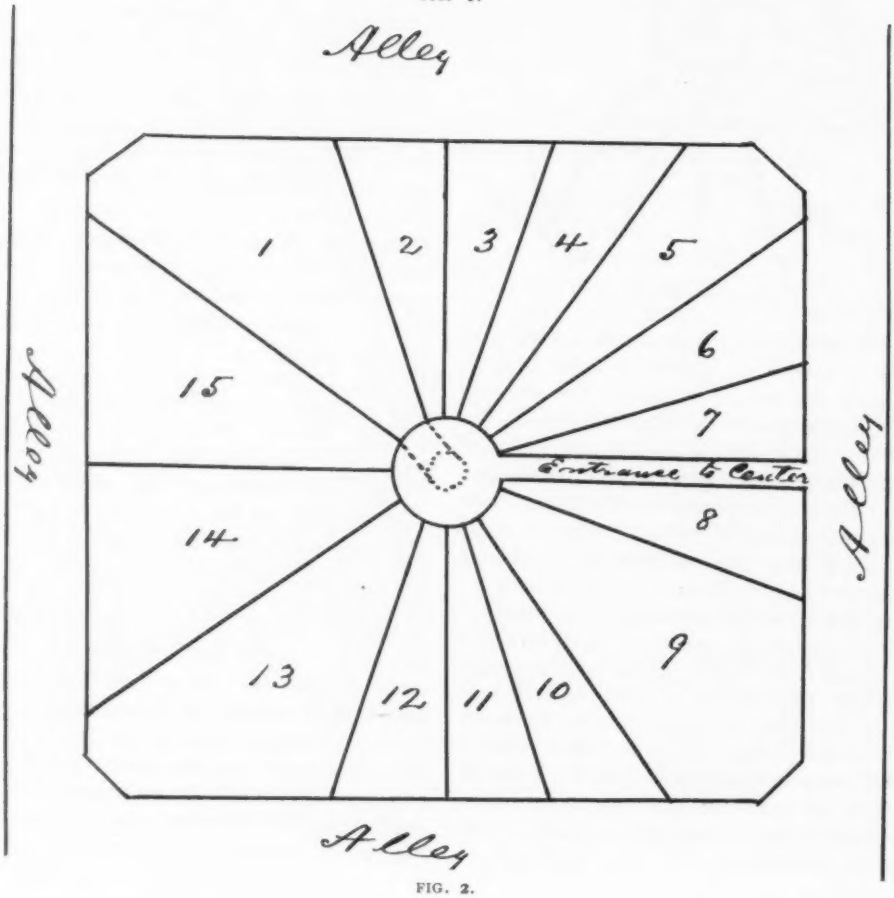

Alley
1
2
3
4
5
6
7
Entrance to Center
8
9
10
11
12
13
14
15
Alley
Alley
Alley

FIG. 2.

room and the picking room enabled the boss picker to notify the man in the store room to swing the pipe in the centre to deliver the batch into any bin desired.

There are many mills that could effect a great economy in labor by transporting loose

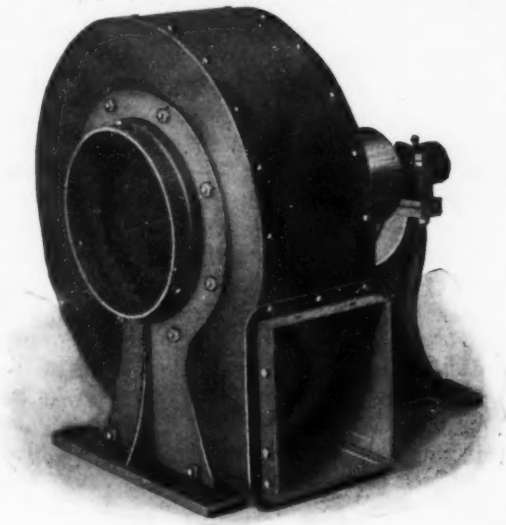


FIG. 3.

stock in this way. Very little power is necessary and the apparatus requires but slight care. The important point is to adjust the

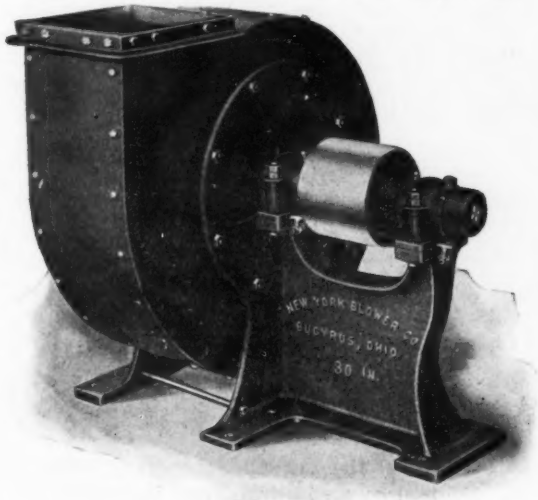


FIG. 4.

size of the fan to the distance and quantity of stock to be transported. Being equally suited to wet and dry stock the many applications of this system will occur at once to every practical manufacturer. The New York Blower Co., 25th St. and Stewart Ave., Chicago, have recently placed on the market a raw stock blower which embodies several new features. It can be quickly adjusted so as to be driven on either side or to discharge in any direction. The fan is heavily built and braced so that at the maximum speed it will run without vibration. It has increased pulley surface, crown sheet of steel, and is fitted with a wheel of entirely original design.

The claim is made that this fan is from 15

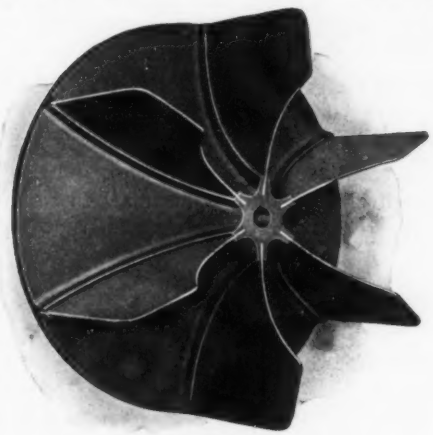


FIG. 5.

to 25 per cent. more efficient than any of the old style fans for blowing stock. The suction side of the fan is supported from the foundation, Fig. 3, which prevents buckling when working under strong suction. Fig. 4 is a view showing the pulley side of the fan.

By referring to the cut of the blast wheel, Fig. 5, it will be seen that the back of this wheel is closed, as a consequence of which it is claimed the back lash is reduced 50 per cent. The suction side being stiffened and the pulsation eliminated, the wheel can be run closer to the housing on the inlet side, reducing the back lash on this side also. The blades of the wheel are solidly cast into the wheel cone. There is no opportunity for stringy material to lodge in this wheel and throw it out of balance. It is especially adapted for handling this stringy material

and is also as effective as the closed wheel in handling short material.

On the pulley side the casing is concave, allowing the journals to be set into the fan case, thus shortening the overhang some 50 per cent. The shaft is of a high grade of steel turned and polished. The journals are ring oiling in design and universal in their adjustment. The outlet of the fan is square so as to get the full area of the discharge. If the discharge is to be through a round pipe a joint of pipe is added with a gradual change from square to round.

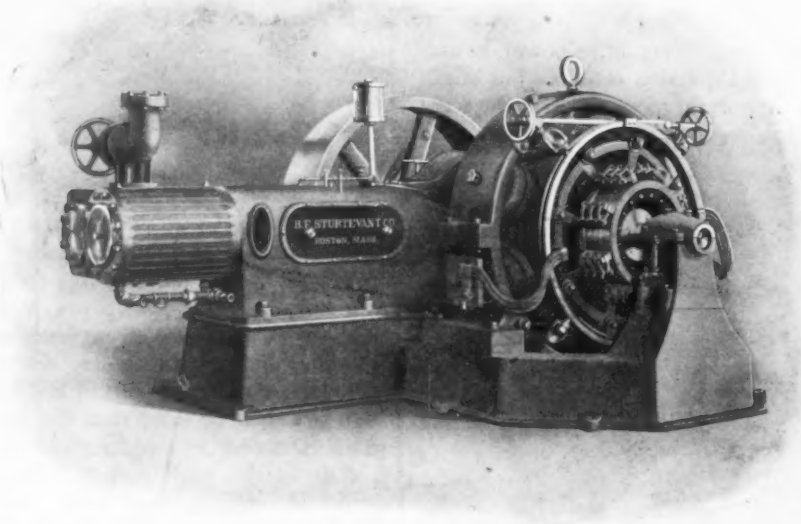
Manufacturers who desire to investigate this method of blowing stock can obtain additional information regarding it upon application to the builders of this fan.

AN IMPROVED ELECTRIC GENERATING SET.

In response for the growing demand for a high class generating set at a reasonable price, the B. F. Sturtevant Company of Boston, Mass., are manufacturing a type, illustrated herewith, which fills this long-felt want. Years of experience in the manufacture of both units have enabled them to perfect such a set.

The general design of the engine embodies all the latest improvements to the horizontal type. The reciprocating parts are substantially constructed and counterbalanced with lead load dises. A feature of construction is that of forging the crankshaft solid in one piece and shrinking the dises on to it. A special arrangement of the Rites' governor gives a regulation within 1 to 1 1/2 per cent. from full load to no load, and by a modification of the Marshall valve gear an adjustment of the cutoff from zero to 70 per. cent. is attained. The main bearings, crankpins, valve stem and slides of this engine are well babbitted with the Sturtevant white metal. A recent and important improvement is the water-shed partition which prevents water from the piston rod stuffing box from reaching the interior of the engine frame, and the oil on the reciprocating parts from being thrown out into the engine room.

The main body of the engine is enclosed on both sides by removable plates, as may be seen from the cut and the crank webs are enclosed by a cast iron hood having two holes with removable covers, one for the purpose of cleaning the crankpin box while it is in motion, and the other for removing



A STURTEVANT GENERATOR.

the box without taking off the large hood. Between the water-shed partition and the front end of the cylinder is a hand hole for reaching the stuffing box bolts without communication to the oil spaces.

There are two oiling systems for this type of engines, the gravity or tank system and that by forced pump lubrication. With the gravity or tank system, shown in the illustration, an oil tank supplies the pipe leading to the parts to be oiled. At each point where the oil is delivered is a little gauge glass and valve for regulating the flow at that point. A valve just below the tank regulates the entire oiling systems.

With the pump or forced lubricating system, a pump is located in the base of the engine and is operated by the crank-shaft. Oil is delivered from this pump to the main bearings and from the main bearings through holes in the crankshaft and web to the crankpin. From this point the oil is conducted up through a hole in the connecting rod to the crosshead pin. A separate pipe conveys the oil from the crosshead guides to the valve stem guides. The pressure of oil in the bearings under this system will vary from 12 to 18 pounds per square inch. The mechanical efficiency of the engine is so materially increased by this system of lubrication that its demand is rapidly increasing. Practically all engine builders will soon be obliged to provide for it to keep abreast of the times.

The generator of this set is of the eight-pole type, and is capable of carrying momentary overloads of 50 per cent. without any shifting of business or flashing of the commutator and an overload of 25 per cent. for a period of two hours without undue heating. After a continuous run of ten hours at full load the increase in temperature above that of the surrounding air never exceeds 40 degrees C. upon the armature and field coils, and 45 degrees C. upon the commutator. The average temperature rise is about 33 to 35 degrees C. Before being shipped the generator is given a breakdown test of 1500 volts, alternating for sixty seconds between the conductors and the frame of the machine to test the insulation.

The magnet frame is the very best grade of cast iron, split horizontally. The pole pieces are of wrought iron with cast iron shoes or horns and are secured to the magnet frame by through bolts. Any of the pole pieces may thus be removed to repair the field coils. The latter are wound up in two sections, with an air space between the shunt and series coils. The shunt winding is of double cotton covered magnet wire of highest conductivity, thoroughly insulated and so treated as to be practically waterproof. The series winding is of solid copper bars insulated in the same manner as the shunt coil.

The armature if of the ironclad, form wound, ventilated drum type, having a core built up of charcoal iron plates which plates after being thoroughly japanned are mounted upon a cast iron spider and securely held in position by end flanges. No belts pass through the armature laminations. The armature spider has an extension upon which is mounted the commutator, making the armature and commutator one unit.

The armature conductors are solid copper bars, without joints except at the commutator end. When these bars are formed they are insulated by material not perceptibly affected by heat or ordinary atmospheric moisture.

In the construction of the commutator only drop-forged or drawn segments are used, these being secured in cast iron shell of spider construction and clamped in place with a steel ring. No cast segments of any nature whatever are used. The segments are insulated with the best quality of carefully selected mica of a degree of hardness to allow the mica and segment to wear uniformly obviating trouble from high mica. The end insulation consists of micanite rings and the whole commutator is assembled while hot, under great pressure. Carbon brushes only are used, the commutator being so proportioned and the brushes of such size as to allow at least one square inch of brush area to every 30 amperes carried. These brushes are carried in holders of most approved construction, each mounted upon a self-contained brush

rigging so arranged that the entire set of brushes may be rotated completely around the commutator.

Hand wheels are furnished for adjusting the brushes in position, these hand wheels being so located that the brushes may be adjusted from either side of the generator.

ALBANY GREASE AND GREASE CUPS.

Almost every engineer is more or less familiar with Albany grease, either by actual experience in using this widely-known lubricant, or by the testimony of other engineers who have found it an article of exceptional merit. It is claimed that the most obstinate bearing will generally yield unconditionally when Albany grease is used and whether on slow or fast running machinery, the results are equally satisfactory, as has been frequently demonstrated. This ideal lubricant is made to suit every condition of climate. Adam Cook's Sons, 313 West St., New York City, who are the only makers, find a large demand for it from all parts of the world. Fig. 1 shows the regular style spindle grease cup, manufactured by the makers of Albany grease, and which they advise being used

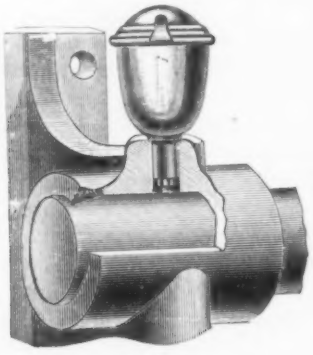


FIG. 1.

with their lubricant for the best results. The accompanying illustration tells its own story largely.

The manner of attaching this cup is simple and can be done by any mechanic. A hole is bored through both the cap and brass of sufficient size to allow the outside tube of the cup to come close to the shaft, observing that only the inside spindle rests on the shaft, the top touching the cup cover. The outside tube being shorter, should come within one-quarter or three-eighths of an inch from the shaft. The inside spindle is then removed and the cup filled with the compound. To replace the spindle only a few churning motions are necessary and the cup is ready for use. Albany grease cups require very little attention and do not get out of order easily. When filled they will run from one to four months, according to conditions, without refilling. They thus effect a great saving in labor as well as in the cost of lubrication. As compared with oil of the general quality used in most manufacturing concerns from twenty-five to fifty per cent. has been saved by actual test.

Albany grease is a pure lubricant, free from all lime, and where it is used with the Albany grease cup, no drip pan is required; it is self-acting and runs only when the shaft is in motion. The feed is largely regulated by the temperature of the bearings, thus preventing overheating. For dynamos and electrical machinery of every description, Albany grease is an excellent lubricant.

To prove all they claim, the manufacturers offer to send free of all expense, one Albany grease cup with sufficient Albany grease for a test The only information necessary to send is the pipe connection in bearing, depth of oil hole from top of cap to journal, and on what part of the machinery the grease is to be tested.

The only sport of an active character to which the Paisley weavers were addicted was the national game of curling. When the frost was keen, and likely to hold, then would the shuttle be thrown down, and not a web finished in Paisley for weeks. Then would the "roaring game" be in full swing, and "soop it up, soop it up," be heard from morn to eve, on the glittering lochs and ponds. Then would the "beef and greens" be reeking rarely on the groaning table of many a cozy "houff," to be followed by song and chatter over the tumblers of steaming toddy. Then would the "cork" forget his dignity for a time, and the minister, the weaver, the laird, and the bailie be bosom friends—as long as the frost lasted.—Matthew Blair, in "The Paisley Shawl."

Dyeing, Bleaching, Printing, Etc.

BLEACHING WOOLEN GOODS BY THE SULPHUR PROCESS.

BY FINISHER.

The bleaching of woolen goods by the sulphur process, although in itself a very simple process, is attended with many apparently slight, but important, details. The fact is well known to all finishers that the lighter the color of the goods the more plainly will all little imperfections show up. When it comes to pure white goods every little speck is sure to assume very large proportions, simply by reason of the contrast. It is, therefore, of the utmost importance that due care be exercised from the start, and this, of course, means first the selection of the proper stock for such goods. There is no use in trying to produce a good piece of white if the stock is at all burry or has much vegetable matter in it. Even if the labor cost is increased in trying to bring such goods out right it will be found to be an impossibiilty, but due care taken at the start will very much simplify matters later on. We will assume that this part of the work has been attended to as it should and the proper amount of care necessary for good results has been bestowed upon the stock in the various processes through which it has to pass before it becomes a piece of cloth. It is then that the finisher's labor begins. Of course the nature of the finish plays an important part at this stage, but it would lead us too far to take up the different finishes.

The washing should be very thorough, not omitting the rinsing, as it is essential that all soap be removed. After the pieces have been carefully washed and thoroughly rinsed, and before anything else is done to them, they should be carefully examined and all those pieces which do not come up to the standard should be laid aside for some darker colors. To do this thoroughly the pieces should be drawn over a table and every spot and pimple looked after and taken out if it is at all possible to do so. After the goods are bleached these little things will show up and mean an allowance, if nothing more. Very often some stain will fail to be dislodged in the washing process, but when it is taken separately in this way with some good strong soap it can usually be taken out. This may be considered as rather too much bother and to entail too much cost, but it must be remembered that white woolen goods are only of the finer grades and on them it will be found that this labor will pay. Right here it may be pointed out that the more care there is taken in the selection of the stock, the less the cost will be for this item. If creditable goods are wanted do not let this examination be omitted.

When the goods have thus been carefully looked over and everything corrected which it is possible to correct, they may be finished in the usual manner up to the process of drying. Before they are put into the extractor it is good policy not only thoroughly to wash the machine, but also to use a sheet over all exposed parts, so that the cloth may not come in contact with the ironwork or the basket itself. A very good way to accomplish this is to take some cotton cloth of about 10/4 or 11/4 width and long enough to surround the basket completely, and put this into the basket pulling it over the rim so that the cloth will not touch it while it is being put in and after all is in wrap this over it so that the cloth will be practically in a bag. This precaution is of much value and as it is not costly it should in all cases be adopted for white goods.

After the pieces come from the napper or gig and are ready for the next process, which would be drying on other goods, they are carefully wrapped in sheets and are then ready for the bleaching process. This article describes the method of bleaching woolen goods by the use of sulphurous acid gas. This gas is produced by the burning of sulphur, the fumes of which are sulphurous acid gas. The goods are exposed to these fumes or gas

long enough to remove the varnish-like matter which adheres to the fibre and which cannot be removed entirely in any other way. Much of this substance may, of course be taken off by treating the goods to a strong bath of sulphuric acid. This acid is of a different nature from the sulphurous acid gas produced by the burning of sulphur. Sulphuric acid does not produce that whiteness and clearness obtained with the sulphurous acid gas. In France the bleaching of wool or woolen goods is now largely done by the use of sulphite of soda, which has been acidified with hydrochloric acid. The best known method is the one called Thom's process. It consists in the use of sulphurous acid gas. According to Thom's sulphuring process, the goods are passed on a long chain up and down over a series of rollers which are placed in a small chamber, and this chamber is filled with sulphurous acid vapors. In a short time the goods are thoroughly bleached. To avoid the expense of a bronze chain for removing the cloth two rails are run lengthwise about a foot from the ceiling and about 6 feet apart. Then have some square sticks about 6 or 8 inches longer than the distance between the rails and about 1 1/4 to 1 1/2 inches square. Enough of the piece is folded to reach from the rails to within a foot of the floor. One of the sticks is passed through the fold and is then lifted with the cloth and placed on the rails. This operation is repeated until the pieces are all strung up and the chamber is filled. The sulphur is then placed in an iron vessel in which some live coals have been placed and this is put in a corner. The sulphur will readily ignite and then it is time to get out and close the door tight. The pieces are left in this chamber for 6 to 12 hours according to the time at command. Where the production of white goods is steady it would be much the better way to fix up for it with the bronze chain, but where white goods are only made periodically and then in small quantities the plan described will answer very well.

The chamber in which the sulphuring is done should be made as tight as possible so as to keep the fumes in it, not alone on account of the bleaching process, but also on account of the deleterious influence upon all animal and vegetable life. The bleaching is performed much more even and satisfactorily if the goods are put in the chamber in a moist state than if they are put in dry, although care should be taken that they do not contain sufficient moisture to make them drip, for this is apt to make the bleaching uneven.

When it can be done it is well to fill the chamber at night, that is just before quitting time, and thus have the bleaching done over night. Put in sufficient sulphur to burn for about four hours as this will give vapor enough for the process. Then in the morning cause the doors to be opened for two or three hours before the goods are to be taken down, for otherwise it will be next to impossible to work in the room and even then it will affect some persons so that they are not able to stay in the room more than a few minutes at a time. After several trials a person will become more accustomed to the fumes and will not be affected as much by them. When the goods are to be taken down the floor should be well covered with clean burlap and sheets and then the pieces may be pulled down on these sheets, tied up and taken to the dye house or wash room or wherever the next process is to be performed.

A small sulphur building is erected in the yard, but far enough away from the other buildings so that the occupants or operatives may not be affected by the escaping sulphur fumes. It must also be borne in mind that these fumes are death to all vegetable life and therefore the building should not be placed where shade trees can be affected. A building compactly put up about 10 feet wide by 30 feet long and 12 feet high to the roof will accommodate 24 to 28 pieces of about 35 yard length. In one corner next to the door a large flat stone should be placed upon which the iron vessel in which the sulphur is burned is set. This is done to prevent a fire from catching in case the sulphur should run over. In the rear there should either be another door or a slide which can be opened so as to let the air circulate through when the sulphuring is completed, otherwise it will take too long before the place will be fit to enter.

That the sulphur fumes may be confined as much as possible, it is necessary that this house be built very tight, for the more of the

fumes escape the longer it will take to complete the process. So far as the bleaching process is concerned, the foregoing description covers it completely, but this after all is the simplest part of the process, at least for those goods which are to be finished white. Such goods as are bleached for the purpose of enabling the dyer to produce brighter colors, as for instance cream, light pink, rose, etc., are now done and may at once be sent to the dyehouse, but pieces which are to be finished white will have to be submitted to a bluing bath. Although the goods are now bleached they are not as attractive looking as when blued. Then also a very strong smell of the sulphur adheres to the goods and this has to be overcome. The pieces are first placed in a clean washer and thoroughly wet down and drained, after which the gates are closed and the washer is filled half full of a solution of 2 per cent. soda. This would give about 2 pounds of soda for every 12 gallons. Let the goods run in this liquor for about 20 minutes. Then rinse for 10 minutes with a good stream of water, after which they are ready for the bluing process.

Very often this process is carried on in the same machine, but this method cannot be recommended, for the goods are too crowded and run in too much of a string or rope fashion to enable the bluing to take hold evenly. A flat or open washer is better for bluing, but on account of the trouble experienced in feeding on the bluing, the best plan is to use a dye kettle with a single reel or drum. The goods are passed over this at their whole width. More than four pieces should not be taken at a time, as it will crowd the goods too much and makes it harder to keep them open. Fill the kettle with sufficient water to cover the pieces well and after they have been around once or twice commence to feed on the bluing. There are many good articles made especially for this purpose, any one of which will give good results if proper care is taken. Feed the bluing on slowly and evenly and then allow sufficient time for the pieces to go once or twice around.

It remains for the individual who has to do the bluing to learn through actual experience just how much to give the goods and how long to let them run, for all these things do not conform to hard and fast rules and what may work well on one set of pieces may not do at all on the next. Let the operative, through experience, determine how much bluing he can put on with safety and when this amount has been given and the goods have run through a couple of times let him take a swatch from the end of one of the pieces and after squeezing it out well, compare it with the standard sample which of course has also been wet out. There is no use trying to shade a wet piece with a dry one. It can be easily seen whether more bluing is needed or not, and by going carefully there is no reason why the goods cannot be brought out uniform. As soon as the swatch taken shows that the goods have enough, lose no time in taking them out and hustle them to the extractor. It does not pay to have white goods lay around any length of time after they have been blued and for that reason it is well to have everything in readiness so that they can be dried at once.

The up and down chain dryer is best adapted for these goods. But no matter what the style of dryer may be it must be as clean as it can be made. All iron bars over which the goods have to pass had better be wrapped with some white cotton cloth. There is a style of chain dryer in use in many places in which the cloth travels horizontally instead of vertically and on this style especial care is needed to keep the goods from coming in contact with the pipes. Where the cloth runs vertically there is not much danger of this trouble, as the pipes are usually in the bottom below where the cloth travels, and the air is forced by means of a fan. It is a good plan to have racks made of white wood slats and placed on the steam pipes, both top and bottom, so that in case the goods should sag they will come in contact with this rack. Some bleachers have blue with warm water. Bluing resembles speck dyeing, and so long as it is carried on cold and a moderate amount of care is used in the handling, the goods will come out even and will not show streaks or clouds, but as soon as the process is carried on with warm water the chances are that no amount of care will keep them from being both cloudy and streaky. Of course a person

may have good luck with a set or two, but on the average there will be more poor goods than good ones.

A NEW PROCESS FOR DYEING SILK.

A process for dyeing blue-black brights and souples of any desired weight has recently been patented in this country by a resident of Paterson, N. J., and is described as follows:

Bright is raw silk from which all the sericin or natural gum has been removed, as by the process of boiling off. Souple is raw silk from which only a portion of the gum has been removed or has been lost in treatment.

A strictly tin-weighted bright or souple colored blue-black independent of the use of coaltar colors or red iron has never heretofore been produced, black iron never having been successfully used on silk weighted with tin alone. Other blue-black brights have been obtained only by a long, complicated, and cumbersome procedure involving loss. A souple, taken as souple at the outset, has never been dyed blue-black, though such a method would effect a great saving. Soupling in course of dyeing it has been found impossible to get over a certain percentage —say a hundred per cent.—of weight, and bright or souple blue-black, the product, has been more or less streaky.

Tin is the most advantageous weighting material and that it has been impossible heretofore to use tin without red iron otherwise the finished product being streaky, and the red iron necessitated the use of yellow prussiate and involved the long and cumbersome processes already sketched; hence the simplicity of the present method, which avoids the employment of red iron and prussiate.

By the new procedure a blue-black bright or souple of any desirable weight can be obtained. Souple can be taken as such at the outset for the purpose, and in the entire procedure no red iron is employed, no prussiate, no didi, no stannous chlorid, and there are fewer steps, saving labor, handling, whereby the silk will be stronger and more durable, a great advantage to the manufacturer in the making up of the goods—that is to say, in the winding and weaving of the dyed silk—and saving expense, and with these advantages there is the pronounced achievement of obtaining a perfect blue-black on a strictly tin-weighted bright or souple.

Heretofore all attempts have resulted in a streaky product, it having been possible to use black iron only on silk weighted with iron or weighted with tin and iron, and black iron never having been successfully used on silk weighted with tin alone, and of obtaining a blue-black of a faster dye than the ordinary black. Blue-black is generally preferred in the market to black; black has only heretofore been made because of the greater difficulty and expense of producing blue-black in heavy weights, that to produce ordinary black the employment of anilin dyes has been essential, and this process being simple and comparatively inexpensive, whereby blue-blacks can by it be made instead of blacks the great cost of anilin dyes is saved. Finally, there is the advantage of simplifying the work and economizing space and labor in the dye-house, inasmuch as the preparatory work—i. e., either soupling or boiling off and weighting—can be performed in one department for colors as well as for blacks.

The process is as follows: A bright is weighted to any desired weight with tin with proper washing, or a souple is weighted to any desired weight with tin, or the silk is soupled in the tin-weighting, and then treated to a bath of water slightly acidulated, preferably with acetic acid. It is then put into a bath of black iron of the usual strength and for the usual time. The silk is taken out of the bath, wrung out as usual, and after the proper time washed, and then placed from two to three hours in what is commonly called "the old black-iron gambier bath"—that is to say, a bath found in dye-houses consisting of the gambier bath in which previous lots coming from the black-iron bath have been dipped—the bath being preferably strengthened with fresh gambier solution, having added to it, according to the shade desired, logwood extract from 30 to 50 per cent. and fustic extract from 40 to 60 per cent., both relatively according to the shade desired, and having

been heated up to about 158° F. The silk is then taken out and washed and placed in a logwood bath, to which is then added soap, the temperature of the bath being raised until the desired shade is obtained. The silk when taken out is of an even and perfect blue-black. It is then washed and finished with oil and acid as usual.

FAST LOGWOOD BLACK ON WORSTED.

A fast logwood black is often required on worsted fabrics; one that will stand light and milling, and not turn green in the wear. It is hardly possible to say that any one of the numerous ways of dyeing logwood black gives a perfectly satisfactory result. Chrome-copper logwood black, although fast to milling, is not so to light, and is apt to turn green. Chrome-logwood black is fast to milling, and rather faster to light than the chrome-copper black, but is much more likely than it to turn green. Iron-logwood black is faster to light than either of these, and less apt to turn, but is less fast than they to milling.

The best copper-chrome black is dyed with 1 1/2 to 2 1/2 per cent. bichromate, 1 to 2 per cent. sulphate of copper, and 1/2 to 1 1/2 per cent. of sulphuric acid. After mordanting with this mixture, free the fabric from every trace of free chromic acid by means of a cold bath of hyposulphite of soda. This is most important, as the free chromic acid is the chief factor in the color turning green. Lactic acid or lactolin can be used in the mordant instead of sulphuric acid. Then dye as usual with logwood and fustic. By treatment with ferrous sulphate after dyeing we get black deeper, and faster to light. The black has only a small tendency to become green, and is quite fast to milling. By dyeing with logwood, fustic, ferrous sulphate, copper sulphate, and oxalic acid, all in the same bath, or by dyeing with logwood fustic and sulphate of copper in a second bath after mordanting with ferrous sulphate, copper sulphate, and cream of tartar, we get a good black, which is not so apt to turn green, and is fast to light but not to milling.—The Dyer and Calico Printer.

FASTNESS TO PERSPIRATION.

The question of fastness to perspiration is becoming daily of greater importance in wool-dyeing, and dye manufacturers are beginning to look for dyes which resist this particular secretion. The sweat glands form a very essential part of the human body, and a large proportion of the waste products is got rid of by their means. It is obvious that to understand the chemical action of perspiration upon dyes is the first step to discovering dyes which will resist it. Our knowledge of the subject is as yet imperfect. Perspiration, like organic secretion generally, is very complicated in composition, and its complete analysis is attended with difficulties hitherto insuperable. The first question is the reaction of the secretion. According to Landois it is acid during repose and alkaline during exertion. He attributes this to variation between the proportions between two distinct secretions, one alkaline and one acid. Neumeister says that the acidity is due tc free fatty acid which becomes neutralized when the secretion increases in quantity. The later researches of Trumpy and Luchtinger have shown, however, that normal perspiration is always alkaline, and that the acid reaction proceeds not from the sweat, but from the decomposition of the grease of the skin. Neither the perspiration proper nor the rancid grease which accompanies it can fail to have its action upon a dye. The cause of the alkalinity is not known with certainty. Trumpy and Luchtinger consider it due to carbonate of soda, but it may be due to carbonate of ammonia formed from urea. Perspiration contains neutral fats, such as palmitine and stearine, and also formic acid, butyric acid, and higher terms of the fatty acid series. Among the inorganic constituents are the chlorides of sodium and potassium, together with traces of alkaline phosphates.

Thus the skin secretion, as a whole, may be acid or alkaline, and it also varies greatly in amount in different individuals, and in the same individual at different times. Inasmuch as abundant secretion is always alkaline, and by its abundance is the most important in its action on dyes, it is easy to see

that the usual acetic acid test for fastness to sweat is of very little use. Lange's proposal to dye a piece of cloth with the dye to be tested, and then to get a freely perspiring person to carry it about in his armpit for a few days, indicates a far more reliable method of procedure. It has been recommended that the dyed sample should be carried on horseback under the saddle during a few hours' sharp exercise. If, for example, we take a black and white pattern dyed with an acid black, it will usually stand the test very well, but in no case will it stand water heated to the temperature of the human body, and containing a little alkali. There is no acid black which will not bleed on to the white under these conditions, and the test is much nearer to the true test of actual wear than is the acetic acid test.

Actual exposure to perspiration itself is, of course, the best test. The next best is a solution of 5 grammes of Marseilles soap and 3 cc. of ammonia in a litre of water. If the dyed sample is well worked in this solution for about ten minutes the amount of bleeding which occurs will be a fair test of the fastness to perspiration. The bleeding is best seen by wringing the sample, and then ironing it dry, without rinsing, between folds of white linen. Observe the effect upon the linen.—The Berlin Farber Zeitung.

FAST REDS ON SILK.

It is well known that it is extremely difficult to dye silk a red which answers the constantly increasing requirements as to fastness with the usual aniline dyes, and the trouble that occurs when a silk, especially a tin-weighted silk, is dyed with alizarines is too well known to every silk dyer. The mordanting is a very troublesome operation, and the dyeing is even worse, and even when the color turns out satisfactorily, which it may do in highly-skilled and experienced hands, both handle and lustre, matters of special importance with regard to silk, are too often irretrievably ruined. Primuline, however, gives us a loophole of escape. If the color must be fast to rain and washing, but has not to undergo much exposure to light, we can, by using primuline by the diazotizing and developing method, get very satisfactory results. The silk is scoured, well rinsed, and grounded in an acetic acid bath with primuline. Enter lukewarm and work for an hour, during which time the bath is gradually brought to the boil. Then rinse and diazotize as usual. Great care must be taken to protect the diazotized silk before development from the direct rays of the sun, which will cause streaks and stains which it is impossible to remove. Even diffused daylight has a bad effect, and the silk should be guarded from it until development, which should, of course, take place with all convenient speed. The developer to be used depends on the shade required. For a full, warm scarlet, for example, we use a solution of 25 lbs. of Schaffer's salt and 15 lbs. of carbonate of soda in boiling water. For garnet, somewhat bluer in shade than the scarlet, we use a mixture of equal parts of beta-naphthol and soda lye of 40 deg. B. For darker shades, such as bordeaux, we use alpha instead of beta-naphthol. Red shades of other kinds can be got with suitable mixtures of developers. Thus, for scarlet or ponceau shades, with a distinct bluish hue, we add to the Schaffer's salt or beta-naphthol some sodium-phenol, made by dissolving phenol in its own weight of caustic soda lye of 40 deg. B. Alpha-naphthol can also be used with sodium-phenol.

With very dark bordeaux shades, however, we must proceed differently, and put direct into the primuline bath a substantive black diazo-dye to darken the bordeaux.

It is not claimed that these methods are extremely easy, and that they can be practiced successfully without care or experience, but it will be found that they offer a most welcome substitute for aniline or alizarine dyeing, whether from the point of view of saving time, trouble, and expense, or from the point of view of the result obtained.

The dyed silk is rinsed, soaped in a boiling soap bath as usual, thoroughly rinsed, and finally brightened with acetic acid.—Textil- und Farberei Zeitung.

The number of cotton spindles in Great Britain in 1903 was estimated at 47,000,000; in the United States at 22,000,000.

DYEING MERCERIZED AND LUSTRED YARN.

The consumption of mercerized yarn is continually increasing, and new articles made with it are constantly appearing. The present state of the silk market is highly favorable to the use of mercerized yarns as a substitute for silk. In fact, the effects now produced with them are so manifold and beautiful that the public has often great difficulty in knowing what is silk and what is not.

It is of great importance for the dyer how the goods have been scoured before mercerization. The scouring must be uniform, or different parts will get differently mercerized, and level dyeing becomes an impossibility. Again, the goods must not be scoured so thoroughly as for bleaching. Of course, for white goods, the brown of Egyptian cotton must be destroyed. Scouring with caustic alkali effects, of course, a partial preliminary mercerization, and the goods shrink to some extent. The threads become rougher and more apt to felt, and the twist of the yarn is affected, especially with coarse counts. Strongly scoured yarns show a greater difference in count before and after mercerization than less sharply treated ones, often as much as 10 per cent. if the yarns have been dried under tension, and more even with the finer counts. Many spinners take advantage of this, buying coarse counts to be sold again as finer counts after mercerization.

The chief difficulty for the dyer is to avoid lessening the lustre. Patterns of bright colors can often only be copied with basic dyes, whereupon the dyer is only too prone to resort to the old tannin and tartar-emetic process. But the formation of the tannin lake damages the lustre, and alumina mordants are worse. Lakes in general should be avoided, however fast they may be. If you must use tannin, cut down the percentage from the old figure of 3 to 6 to 3/4 to 1. This quantity is quite enough for light shades, and the use of tannin can always be avoided with dark shades. Another point is not to use too much soap in getting crackle, and, before souring, the yarns must be well wrung, or, better, centrifuged, or the decomposed soap will coat the fibre with fatty acid.

We are thus practically restricted to the substantive dyes, but a selection from them is necessary. The affinity of mercerized cotton for dyes is so great that levelness can be secured only with the most soluble substantive dyes.

It is usually said that it is better to add Turkey red oil to the dyebath than soap, but a soapbath answers perfectly well, if it is not too strong. The concentration should not exceed 1 pound of soap to 20 gallons of bath, or the yarn will swim on the top. This also happens if the soapbath is too hot. Too high a temperature of the bath, and too much soap in it, both cause unlevel dyeing. The use of soap saves labor as compared with Turkey red oil, for with light shades we go straight to the acid bath after wringing or centrifuging. The acid bath should contain some non-volatile organic acid as well as the acetic acid, so that the yarn retains a slightly acid reaction after the evaporation of the acetic acid, and so does not lose its crackling handle. In dyeing to pattern it must be remembered that nearly all substantive dyeings are slightly changed by the souring. Blue, green, and yellow usually become somewhat brighter, and pink acquires a yellowish tone. The pattern should, therefore, be treated in the same acid bath for the sake of comparison.

The bright colors can be covered with basic dyes in the acid bath, and this fact can be taken advantage of for correcting slight errors. Dark colors are usually diazotized, to make them fast enough to washing, and in this case Turkey red oil is better than soap in the dyebath, because less of it has to be used; it rinses out better, and is not so apt as soap to form compounds with hard water, which cause unlevel dyeing.

After-treatment with metallic salts is not to be recommended, as they injure both feel and lustre, and often make the dyeing unlevel to boot.

To give a pure white to bleached yarns, they are blued, usually with a methylene blue. This is done in a lukewarm soap bath, 1/2 lb. soap to 10 gal. The goods are then soured in a bath containing 5 per cent. acetic

and 3/4 to 1 per cent. tartaric acid (on the weight of the goods), and having about twenty-five times the weight of the goods. The acid bath can be reinforced for use over and over again.

Lustred yarns are often mixed with mercerized yarns, or used alone. They have no special difficulty for the dyer, for the lustring is done after dyeing. Remember that the lustring process always darkens the shade a little. Most of the dyeing is done with dyewoods on account of the great fastness to light required. For red the marks of Croceine Scarlet are used, for the sake of their brightness and fastness to light. They must be added to the lustring-mixture. Although the dye-makers recommend their direct and sulphur dyes for lustred yarns, these products are in no position to replace logwood for black, as they cost more, and give an inferior dyeing.

The following process can be recommended:

Black on 100 lb. Goods.

10 lb. logwood extract,
2 lb. soda-crystals,
25 gal. water.

Pass the goods through the lukewarm bath, put them in a tub, and pour the liquid over them. Let them lie six hours, or over-night, wring, and work for half an hour in a bath of

5 lb. ferrous sulphate,
2½ lb. levigated chalk.

Drain, and hang up.

The wringings are used in making a fresh bath, through which the goods drained from the iron bath, but not wrung, are passed, and dried without wringing. For a deeper black add to the first logwood bath

¾ to 1 lb. sumach extract,
½ to 1 lb. fustic extract.

—From the Leipziger Farber Zeitung.

HALF-SILK DYEING.

Like half-wool, half-silk may be dyed by the one-bath or the two-bath process. In fact, the treatment of the two sorts of fabrics only differs in so far as properties of the fibre interwoven with the cotton are different in the two cases. In dyeing half-silk very little Glauber's salt must be used, and none at all for light shades, as the salt injures the lustre of the silk. The half-silk bath must be more alkaline than is required for half-wool, and the reaction is secured by adding soap and carbonate or phosphate of soda. Soap is of great assistance in preserving the lustre of the silk.

In the one-bath process the half-silk is entered into the lukewarm dye bath, which is then gradually brought to 80 to 90 deg. C., at which temperature it is kept for about an hour. For light shades, the bath contains 2 to 3 grammes soap, 0.1 to 0.2 gramme soda, or 0.8 to 1.2 grammes of soap, and the same weight of phosphate of soda, per litre. For dark shades, 4 to 5 grammes common salt are also added.

The cotton is allowed to dye in the cooling bath, and if the silk is to be the darker, the bath must be less alkaline. If, as happens with many dyes, the silk does not get sufficiently dyed, it must be topped with acid or basic dyes in a fresh bath with from 3 to 6 per cent. acetic acid, cold for basic dyes, at 30 to 50 deg. C. for acid dyes. For getting two-color effects (changeants), both wool and silk can be dyed together in some cases. For example, either Alkali Blue or Direct Yellow is dyed in one bath, followed by a rinsing and souring. The more usual practice, however, is to use dyes which leave the silk white, and then to dye the silk in a fresh bath with an acid dye of a color contrasting with the cotton. Another method is to first dye the silk with dyes which leave the cotton white, and then to dye the cotton with a basic dye on a tannin-antimony mordant. To load the silk, the fabric is often put through a stannic-chloride bath of 14 deg. B. between mordanting and dyeing.

Gloria—i. e., fabrics consisting of silk and wool—can be dyed in a single bath with acid dyes, and sometimes, but rarely, with basic dyes. Many dyes differ greatly in their affinity for the two fibres. For example, most acid dyes at the boil dye the wool only, and go best on the silk at 50 to 60 deg. C. Dyes which dye both wool and silk uniformly at the boil are, of course, excluded. We can use only such dyes as Methyl Violet and Victoria Blue, which have more affinity for silk than wool, or as Ponceau and Acid Fuchsine,

which have more for wool than silk, or Citronine, which dyes only the wool at the boil. With dyes which dye the wool more than the silk, what dye has gone on to the latter can be removed with a weak soap bath, whereupon we can proceed to dye the silk as desired. Substantive dyes are much used for gloria. Yellow dyes, such as Chrysophenine, dye the silk very deeply in an acid bath, and the wool hardly at all, so that they must be used with Glauber's salt and a weak alkali. Various effects can be produced. For example, if we dye the wool with Acid Fuchsine and 5 per cent. of tartar-preparation at the boil, rinse, strip the silk at 60 to 70 deg. C. with a soap bath of 3 grammes and 1 litre, we can then dye the silk in a fresh neutral or slightly alkaline and cold or lukewarm bath with Acid Green, rinse, brighten with acetic acid, and dry.—Berlin Farber Zeitung.

New Color Cards.

Oxy Diaminogene; Cassella Color Co., 182 Front St., New York City.

Two samples of raw cotton yarn, four of mercerized cotton yarn, two of mercerized cotton cloth, one of velveteen, and one of knit goods, dyed black with different percentages of Oxy Diaminogene FF and FFG.

Tetrazo Sulphur Colors; American Dyewood Co., 156 William St., New York City.

A card with eight samples of cotton yarn showing 2 and 8 per cent. dyeings of the Tetrazo Sulphur Browns, 3R, 3G, RG, and CR.

DYE RECIPES.

The following recipes appear in the Dyers' Supplement, which is issued each month by the TEXTILE WORLD RECORD. The Supplement contains the colored samples, dyed according to recipes given. The selection of samples is carefully made, and it is the aim to show shades which are of especial interest to the dyer, and which the requirements of the market demand. The Dyers' Supplement is a 16-page pamphlet, in convenient form for preservation Subscription price for the Dyers' Supplement $1.00 per year

Recipe No. 33.

Black on Cotton Yarn.

Lenew Direct Black E on 100 lbs. cotton yarn. Prepare the dye bath with

5 lbs. Lenew Direct Black E.
(F. E. Atteaux & Co., 174 Purchase St., Boston.)
20 lbs. Common Salt.

Enter yarn at 170° F. and dye at the boil for one hour.

Lenew Direct Black E is an excellent color for the dyeing of cotton and wool union goods. It possesses good fastness to light and washing. On union goods the 20 lbs. of Common Salt should be replaced with 10 lbs. Common Salt and 10 lbs. Glauber's Salt.

Recipe No. 34.

Brown on Worsted Yarn.

Domingo Alizarine Brown B on 100 lbs. worsted yarn. Prepare the dye bath with

4 lbs. Domingo Alizarine Brown B.
(C. Bischoff & Co., 88 Park Pl., New York.)
4 lbs. Sulphuric Acid.
15 lbs. Glauber's Salt (Crystals).

Enter yarn at 180° F., bring to a boil and dye at a boil for about one hour. When the bath is practically exhausted add

2 lbs. Potassium Bichromate,

and aftertreat in this bath for one-half hour at a boil.

Domingo Alizarine Brown B possesses great coloring power, and is excellent for the production of compound shades in combination with the other Domingo Alizarine colors. It possesses excellent fastness to light and all the other common color destroying agencies.

Recipe No. 35.

Green on Worsted Yarn.

Alizarine Green C 3 G Paste on 100 lbs. worsted yarn. Prepare the dye bath with

10 lbs. Alizarine Green C 3 G Paste.
(Farbenfabriken of Elberfeld Co., 40 Stone St., New York.)
10 lbs. Glauber's Salt (Crystals).
5 lbs. Acetic Acid.

Enter at 120° F., bring slowly to a boil and allow to boil until the dye bath is practically exhausted. It is advisable to add the acetic acid in two portions.

Cool the bath to 150° F. and add

2 lbs. Potassium Bichromate.

Bring slowly to a boil and boil one-half hour longer.

Alizarine Green C 3 G Paste, when applied as above, gives a very bright shade of green, which is extremely fast to light, washing, milling, stoving and perspiration.

Recipe No. 36.

Blue on Worsted Yarn.

Domingo Alizarine Blue R on 100 lbs. worsted yarn. Prepare the dye bath with

4 lbs. Domingo Alizarine Blue R.
(C. Bischoff & Co., 88 Park Pl., New York.)
10 lbs. Glauber's Salt (Crystals).
3 lbs. Acetic Acid.

Enter yarn at 180° F., bring to a boil and dye at a boil for one-half hour.

Then add

2½ lbs. Sulphuric Acid

and continue the dyeing one-half hour longer. When the dye bath is practically exhausted add

1½ lbs. Potassium Bichromate

and aftertreat one-half hour in this bath at a boil.

Domingo Alizarine Blue R possesses excellent coloring power, and great fastness to light and the other common color destroying agencies.

Recipe No. 37.

Violet on Cotton Yarn.

Thiogene Violet V on 100 lbs. cotton yarn. Prepare the dye bath with

6 lbs. Thiogene Violet V.
(H. A. Metz & Co., 122 Hudson St., New York.)
3 lbs. Sodium Sulphide.

The dyestuff and sodium sulphide are dissolved together in boiling water and then added to the dye bath.

The yarn is then entered and the dyeing continued for one hour at nearly a boil.

The addition of salt and soda ash to the bath is unnecessary.

In standing baths the color may be reduced about one-fifth.

Thiogene Violet V is recommended on account of its novel feature of being a sulphur color and at the same time producing bright shades of violet. It is very fast to light, washing, fulling, boiling, acids and alkalies, but is not fast to chlorine.

Recipe No. 38.

Red on Worsted Yarn.

Sulphon Red S R on 100 lbs. worsted yarn. Prepare the dye bath with

2 lbs. Sulphon Red S R.
(Walter F. Sykes & Co., 85 Water St., New York.)
4 lbs. Sulphuric Acid.
10 lbs. Glauber's Salt.

Enter at 140° F. and dye at a boil for three-quarters of an hour.

Sulphon Red S R is a new fast red of the Roccelline series, but superior to the old types in solubility and brilliancy of shade. It dyes level at high temperatures, combines well with other colors, and possesses excellent fastness to light, washing and fulling.

Recipe No. 39.

Black on Cotton Yarn.

Puretone Black on 100 lbs. cotton yarn. Prepare the dye bath with

5 lbs. Puretone Black.
(F. E. Atteaux & Co., 174 Purchase St., Boston.)
20 lbs. Common Salt.
2 lbs. Soda Ash.

Enter yarn at 170° F. and dye at a boil for one hour.

Puretone Black is excellent for the dyeing of cotton and wool union goods, and possesses good fastness to both light and washing. In dyeing union goods 10 per cent. of Common Salt and 10 per cent. of Glauber's Salt should be used.

Recipe No. 40.

Brown on Cotton Yarn.

Paranol Brown G G on 100 lbs. cotton yarn. Prepare the dye bath with

2 lbs. Paranol Brown G G.
(E. M. Thayer & Co., 106 Broad St., Boston.)
20 lbs. Common Salt.

Enter at a boil and dye at a boil for one hour.

Paranol Brown G G is a very level dyeing color and can therefore be used in combination with other direct colors. It does not redden in drying and is fairly fast to light.

Recipe No. 41.

Light Tan on Cotton Yarn.

Light Tan A on 100 lbs. cotton yarn. Prepare the dye bath with

2 lbs. Light Tan A.
(Read Holliday & Sons, Ltd., 7 Platt St., New York.)
25 lbs. Common Salt.

Enter at boil and boil from one-half to one hour.

Recipe No. 42.

Greenish Blue on Worsted Yarn.

Tetra Cyanole V on 100 lbs. worsted yarn. Prepare the dye bath with

2 lbs. Tetra Cyanole V.
(Cassella Color Co., 182 Front St., New York.)
4 lbs. Sulphuric Acid.
15 lbs. Glauber's Salt.

Enter at 180° F. and dye at a boil for one hour.

Tetra Cyanole V possesses level dyeing properties, gives an excellent shade greenish blue.

Recipe No. 43.

Blue on Woolen Cloth.

Indocyanine B on 100 lbs. woolen cloth. Prepare the dye bath with

4 lbs. Indocyanine B.
(Berlin Aniline Works, 213, 215 Water St., New York.)
5 lbs. Ammonium Sulphate Crystals.

The Ammonium Sulphate (which must not be

acid in reaction) should be added and the bath brought to a boil before the color is added. After the color is added the bath is again boiled for a few minutes and the steam turned off. Enter goods, again bring to the boil and dye at a boil for one hour.

About 10 per cent. of the color will remain in the bath after the dyeing is completed, and for this reason it is economical to use a standing bath. If the bath is not to be used again, to exhaust as completely as possible, run in some cold water toward the end of the dyeing and add

2 to 3 lbs. of Acetic Acid (well diluted),

and work a few minutes longer.

Indocyanine B gives a blue of excellent tone which possesses excellent fastness to light, alkalies and washing. Its fastness to milling, rubbing, perspiration and carbonizing is also very good.

Recipe No. 44.

Dark Tan on Cotton Yarn.

Dark Tan D on 100 lbs. cotton yarn. Prepare the dye bath with

2½ lbs. Dark Tan D.
(Read Holliday & Sons, Ltd., 7 Platt St., New York.)
25 lbs. Common Salt.

Enter at boil and boil from one-half to one hour.

Recipe No. 45.

Blue on Cotton Yarn.

Thionol Blue B W on 100 lbs. cotton yarn. Prepare the dye bath with

16 lbs. Thionol Blue B W.
(Thomas Leyland & Co., 53 India St., Boston.)
16 lbs. Sodium Sulphide (Crystals).
80 lbs. Common Salt.
2 lbs. Glucose.
200 gallons Water.

Dye for one hour on bent sticks, keeping the yarn well under the liquor, give three turns during the hour, and work gently during the rest of the period. The temperature of the dye bath should be kept well below the boiling point (150° to 180° F.)

After dyeing wring quickly and rinse at once, turning well in the first rinsing water, to which a little sodium sulphide may be added.

For subsequent lots only one-half to two-thirds of the amount of color given above is necessary.

Thionol Blue B W is exceptionally fast to light and washing and it is recommended as a substitute for indigo which it resembles in shade.

Recipe No. 46.

Green on Cotton Yarn.

Thionol Dark Green on 100 lbs. cotton yarn. Prepare the dye bath with

6 lbs. Thionol Dark Green.
(Thomas Leyland & Co., 53 India St., Boston.)
12 lbs. Sodium Sulphide.
1 lb. Soda Ash.

Dissolve the above in the bath containing about 200 gallons of water.

Boil up the bath until solution is complete, then add

50 lbs. Common Salt.

Dye one hour just below boil, rinse and wring quickly, then dry.

Thionol Dark Green is a very concentrated sulphur color and gives a deep shade of green, which is extremely fast to light, washing and cross dyeing without any after treatment. The amount of dyestuff used in a standing bath may be reduced about one-third.

Recipe No. 47.

Blue on Cotton Yarn.

Katigen Blue B on 100 lbs. cotton yarn. Prepare the dye bath with

15 lbs. Katigen Blue B (9).
15 lbs. Sodium Sulphide Crys. (9).
(Farbenfabriken of Elberfeld Co., 40 Stone St., New York.)
5 lbs. Soda Ash (2).
25 lbs. Common Salt (5).

Figures in brackets refer to standing baths.

Dye just at the boil for one hour.

Katigen Blue B is characterized by its great productiveness, fastness to light, alkalies, acids, cross dyeing and washing.

Recipe No. 48.

Yellow on Cotton Yarn.

Sulphur Yellow R on 100 lbs. cotton yarn. Prepare the dye bath with

6 lbs. Sulphur Yellow R (Standing Bath).
(Berlin Aniline Works, 213, 215 Water St., New York.)
30 lbs. Sodium Sulphide Crystals.
5 lbs. Soda Ash.
50 lbs. Common Salt.

Dissolve the dyestuff and sodium sulphide separately in boiling water. Boil up in the dye bath with the soda ash and finally add the common salt.

Enter yarn just below the boil and dye at about 200° F. for one hour.

When the dyeing is completed rinse immediately, then wring and dry.

Sulphur Yellow R possesses good fastness to washing, rubbing, alkalies and acids. Its fastness to light is sufficient for most purposes.

Mill News.

COTTON.

New Mills.

*Alabama, Huntsville. Work has been practically completed on the No. 3 mill for the Lowe Manufacturing Company. This mill will have capacity of 25,000 spindles.

*Georgia, Cartersville. The American Pad & Textile Co. is putting the machinery in operation as rapidly as operatives can be secured. At present this plant has 26,000 spindles and 580 looms in position, and will add about 4,000 spindles and 70 looms in short time. The main building of this plant is 130 by 320 feet, and picker house, 75 by 150 feet, 3 stories high. They propose doubling the equipment (30,000 spindles and 650 looms) which will also necessitate enlargement of all buildings during the year.

*Maryland, Baltimore. Operations will be started in about a month in the new plant for the William E. Hooper & Son's Co., capitalized at $400,000. James E. Hooper is president of the company; Robert P. and James P. Hooper, vice-presidents; William E. Hooper, secretary and treasurer and John R. Dorsey, secretary. Cotton duck yarn, rope, twine, wicks, sash cord, etc., will be made. Plant will have capacity of 10,000 spindles and 100 looms.

*Massachusetts, New Bedford. Work is progressing on the new Kilburn Mill. The engines are being installed. The picker room is now ready for machinery and it is expected that the plant will be ready to start operations in May. Andrew Currier, formerly with the New England Cotton Yarn Company, will be superintendent.

*Massachusetts, Taunton. Preparations are being made for installation of the new machinery in the Watuppa Mills.

*North Carolina, Selma. The Selma Cotton Mills have started installing the machinery equipment. It is expected that the plant will be ready to start up about March 1st. They will operate 5,280 spindles and manufacture number 22 hosiery yarns.

Pennsylvania, Mount Joy. The Herlig Brothers' Cotton Worsted Company has leased one of the Carlisle Manufacturing Company's mills and will manufacture cotton fabrics.

Rhode Island, Woonsocket. F. B. Wilkens, formerly of F. B. Wilkens & Co., has built a new mill and equipped same with looms of his own invention, and is now manufacturing plain and fancy tapes.

*South Carolina, Camden. The Pine Creek Manufacturing Company has been incorporated with capital stock of $300,000 to operate the De-Kalb Cotton Mills. Colonel T. C. Duncan is president of the company. Among the directors are Stephen A. Jenks (Pawtucket, R. I.) and Hon. John P. Branch (Richmond, Va.). W. E. Touchstone is general superintendent of the plant, which has been in operation for the last few weeks. The equipment will be increased from 12,000 to 19,000 spindles and 300 to 475 looms. Company's main office will be at Union.

*South Carolina, Clifton. The Clifton Manufacturing Co. has started work in their No. 3 mill and expects to have the total equipment of the plant (35,000 spindles and 1,050 looms) in operation shortly.

*South Carolina, Marion. The main building for the Marion Cotton Mills is completed and ready for machinery. It is expected that the plant will be ready to start operations early in March.

*South Carolina, Yorkville. The Neely Manufacturing Company, of which Thos. P. Moore is president and treasurer, will start up about July, making 8/3 warps, skeins and tubes. As previously reported, they will operate 3,500 spindles, using steam power.

Enlargements and Improvements.

Alabama, Tuscaloosa. The Tuscaloosa Mills have completed erection of a yarn mill which will furnish yarn for the Roseneau Hosiery Mills, making ladies' hosiery.

*Alabama, Uniontown. The Ellawhite Cotton Mills have increased the capital stock from $100,000 to $175,000, for purpose of installing additional machinery in the mill. They will put in 5,200 more spindles, which have been ordered.

Connecticut, Danielson. A number of fancy looms have been installed in the Cochrane Manufacturing Company's plant for manufacturing fancy goods.

Connecticut, Uncasville. The Uncasville Manufacturing Company is making preparations to instal a new 350 h. p. engine in the plant to replace the old ones.

Georgia, Chattahoochee. The Whittier Cotton Mills have placed contracts with the Lowell Machine Shop for new machinery.

Georgia, Columbus. The Eagle & Phoenix Mills are to double the capacity of the rope department and have placed orders for all the necessary machinery.

*Georgia, Hampton. The Hampton Cotton Mills are installing machinery which will about double the present capacity. They will put in 3,116 additional spindles.

Georgia, Lavonia. The Lavonia Cotton Mills have installed 3,500 additional ring and 1,212 twister spindles, increasing number of spindles to 6,000 and 2,500, respectively.

Georgia, Palmetto. The Palmetto Cotton Mills are to expend about $20,000 for improvements.

They propose building an addition, 75 by 100 feet, for purpose of putting in additional machinery.

Louisiana, New Orleans. The Maginnis Cotton Mills are to replace some old machinery with that of modern make.

Massachusetts, Chicopee. The Dwight Manufacturing Company is to equip the plant with electricity for power and lighting. At present they use steam and water. Contract for the above has been placed with the Westinghouse Electric and Manufacturing Company.

Massachusetts, Lowell. A new five-story mill, 200 by 75 feet, is to be erected by the Appleton Company. The present picker house, two stories high, will be torn down. A 1200 h. p. engine will be put in.

Massachusetts, Lowell. The Appleton Mills have added 58 new Draper looms to the plant. A total of 208 will be put in during the next few weeks.

Mississippi, Magnolia. Additional machinery is being installed in the Magnolia Cotton Mill and when placed will nearly double the capacity of the plant.

New Hampshire, Manchester. Preparations are being made for building another story to the picker room of the Armory Corpn's mill. Construction work will start early in the spring.

New Hampshire, Nashua. The Nashua Cotton Mills will soon start work on erection of a new dye house. The building will be 360 by 75 feet and will be equipped with the most improved machinery. It is understood that the old plant will be torn down upon completion of the new one.

New York, Oswego. A number of new machines are to be installed in the Standard Yarn Company's plant and capacity greatly increased.

North Carolina, Charlotte. The new building for the Mecklenburg Cotton Mills, 110 by 180 feet, two stories, has been completed and preparations are now under way for installing the machinery. At time of organizing it was planned to install 6,500 spindles for making yarns from cotton waste, but they now propose putting in 15,000 spindles and 450 looms and manufacture high grade cotton cloth. William Coleman is president of the company.

*North Carolina, Oxford. Work has been started on erection of an addition, 48 feet long, to the Oxford Cotton Mills. Additional machinery will be installed.

*South Carolina, Dillon. Contract has been let for the erection of the new building, 100 by 225 feet, for the Maple Cotton Mills. They will install 8,500 new spindles.

Tennessee, Chattanooga. The Bowen-Jewell Co. at Jewell's, Ga., is to remove the plant to this city. The building formerly occupied by the Ruohs Cotton Mills has been purchased. It is proposed to have the new plant ready to start operations in about two months.

Texas, Corsicana. The Corsicana Cotton Mills are being operated with a night and day force. This company contemplates enlarging and improving the plant, expending about $30,000.

WOOLEN.

New Mills.

*Canada, Quebec, Coaticook. The Barnston Woolen Mill Company, whose plant, formerly located at Ways Mills, was destroyed by fire, will be rebuilt at this place. A new brick building will be built and equipped with one set 60-inch cards and 4 broad looms. A. H. Dyson is manager of the plant which manufactures blankets, tweeds, flannels and yarns from coarse Canadian wool. Work will start shortly on the new building.

*Massachusetts, Clinton. W. V. Brodmerkle, who purchased the lower brick mill of the Clinton Worsted Co., will start operations with 15 Crompton looms and 2 sets of cards for woolen yarns, to manufacture fancy worsteds. The mill will be operated as the Earnsdale Worsted Mills and will be put in operation about the middle of April. Finishing will be done at the mill but no dyeing.

*Massachusetts, West Millbury. The Arkonia Fabric Manufacturing Company has been incorporated with capital stock of $25,000. This company will operate the weaving and finishing departments of the Hoyle & Windle Mills, reported some time previous as being laesed by Albert Crenshaw. Among the incorporators of the new company are Mr. Crenshaw and Joseph C. Sullivan (New York).

*Missouri, Kansas City. The Topeka Woolen Mills, at Topeka, Kans., have been sold and will be removed here during the fall. A new company will be organized and both Messrs. McAfee and Fleischman, of Topeka, will be interested in the new organization.

*Missouri, Kansas City. The Herschberger-McAfee Woolen Mills have been incorporated with capital stock of $150,000. Site has been secured and arrangements will be made for the erection of a five story building, 120 by 80 feet. Will be equipped with 4 sets machinery. W. E. Herschberger (Princeton, Mo.), is president of the company; J. F. McAfee, Jr. (Topeka, Kan.), secretary; A. C. Castile (Princeton), treasurer, and J. F. McAfee, general manager.

*Pennsylvania Philadelphia. Wright, Hall & Co., reported recently to start operations shortly making men's wear, are located at Hancock and Jefferson Streets.

*Pennsylvania, York. The Keystone Carpet Mills, reported to start a plant here, will begin operations about March 1st, making rag, jute and domestic carpets. John A. Schwartz is superintendent of the mill, which will be equipped with 12 to 15 looms. W. T. Sibbet is buyer for the mill. Product will be sold direct. Will use electrical power.

*Rhode Island, Greystone. Operations have started with a small force in Joseph Benn & Sons' new mill. The output of the plant will be gradually increased until about 1,000 people are employed.

*Rhode Island, Olneyville. The new plant of the Centredale Worsted Mills has been completed. The plant will be operated as the Centredale Worsted Mills Combing Plant. All the cards and combs are being moved to the new mill where all work of this kind will be done.

Enlargements and Improvements.

Illinois, Lacon. Plans have been prepared for a large addition to the Jno. Grieves & Son's mill, for carding, spinning and weaving machinery.

Kentucky, Louisville. The Louisville Girth & Blanket Mills are to install additional machinery, order for which has been placed with the Lowell Machine Shops, Lowell, Mass., in the plant. They will now make their own yarns.

Maine, Madison. An additional story will be built to the Indian Spring Woolen Company's mill.

Maine, Readfield. Frank Chase, of the Chase Manufacturing Co., Waterville, Maine, has purchased the woolen mill and will operate it in connection with the Waterville plant. New and improved machinery will be put in.

Maine, Sanford. The Goodall Worsted Co. is to install 54 new looms in the plant. These looms have been received and will be set up as soon as possible.

Massachusets, Holyoke. Work will start at once on demolishing the old mill building to make way for the new weave shed to be erected for the Farr Alpaca Company. The Farr Company will also begin erection of a power house for furnishing and distributing its own electricity.

Massachusetts, Leicester. The Leicester Woolen Co. is to install four new Crompton & Knowles looms in the mill.

Massachusetts, North Adams. Waterhouse & Buffum are to install some additional machinery in the mill. A portion of the plant will shortly be started in operation nights.

Massachusetts, North Billerica. The Talbot Mills are installing new machinerey in the carding department.

*Massachusetts, Oakdale. Work has been completed on the new boiler house for the Glenn Mills, James Dorr, proprietor. A tank for fire protection, with capacity of 10,500 gallons, 14 feet high, is also under construction.

Massachusetts, North Andover. The Brightwood Manufacturing Company is installing 26 additional Knowles looms, also an upright boiler.

Massachusetts, Plymouth. The weave shed of the Standish Worsted Mills will be increased by erection of an addition of 80 feet. About 40 new looms will be put in. It is expected to have the addition completed by April 1st.

Massachusetts, Uxbridge. C. A. Root & Co. have installed five new Draper looms in the plant. This gives the plant a total of 25.

Michigan, Detroit. The Pioneer Woolen Mills Company is to increase the capital stock to $100,000.

Michigan, Yale. C. Andreae & Sons, proprietors of the Yale Woolen Mills, has been reorganized into a joint stock company with capital stock of $100,000. As soon as weather permits, additions will be made to the mill, doubling the present capacity.

*New Hampshire, Guild. Work will be started in the spring on erection of a new building, 84 by 50 feet, for Fairbanks & Dorr. They will increase the present equipment of 5 sets to 8.

New Hampshire, Marlboro. Richardson & Pease have installed some new machinery in the plant, including 2 new looms.

New Jersey, Garfield. An addition is being built to the Garfield Woolen Company's mill at a cost of about $25,000.

New York, Amsterdam. An addition 60-inch garnett and card combined has been installed in Chas. W. Becker's mill.

New York, Cohoes. W. Loewenthal & Co. have recently installed a three-cylinder garnett machine in the mill.

*New York, East Salem. The Eagleville Woolen Mills have been closed for purpose of making necessary repairs and placing the new machinery. Operations will be started about April, making horse blankets.

New York, Schenectady. Charles Mahoney & Co. have recently put in two three-cylinder garnett machines and a rag picker.

North Carolina, Greensboro. An addition will be built to the Van Deventer Carpet Mills and additional square and broad looms will be installed.

Ohio, Ashtabula. The Ashtabula Worsted Mills will start work in the spring on erection of a large addition to the plant. They will increase the number of looms to 150 and make additions of ther machinery.

Ohio, Cleveland. The National Woolen Co., which recently completed erection of a large addition, 100 by 100 feet, for sorting rags, is to erect another building 150 by 50 feet, for carbonizing and extracts.

Ohio, Dresden. A new picker house is to be erected by the Dresden Woolen Mills to replace the one destroyed a short while ago. A new picker and two sets of cards will be out in.

Pennsylvania, Glen Riddle. The Glen Riddle Manufacturing Co. is making preparations to double the present capacity of the plant. Among the improvements to be made will be the installation of two new dryers and 10 carding machines.

*Pennsylvania, Lenni Mills. The Yorkshire Worsted Mills reported to make additions to the plant, will install 60 of the additional looms this month and the other 60, which will make a total of 200, in September.

Rhode Island, Harrisville. The Glen Worsted Mills are installing a complete set of finishing machinery. Previous to installing the new machinery the finishing has been done at the Tinkham Mills.

Rhode Island, Lafayette. The Rodman Manufacturing Company is to install 20 broad (Crompton) looms in the mill.

Rhode Island, Providence. C. L. Blanding & Co. have recently added some mules, 360 spindles and additional spooling machinery.

Rhode Island, Westerly. The Pawcatuck Woolen Mills are to install 2 sets of D. & F. cards.

Rhode Island, Woonsocket. The Lafayette Worsted Company, which has been operating the plant with a night and day force, is installing additional machinery and greatly increasing the capacity.

*Wisconsin, LaCrosse. The Onalaska Woolen Mfg. Co. advises us that after this season they will discontinue making of woolen yarns and will make up all their production in men's woolen hosiery, mittens and flannel overshirts, and will increase the production to meet their growing trade.

Mills Starting Up.

*Massachusetts, Huntingdon. Preparations are being made by the Massasoit Woolen Mills to start up the machinery on a new line of fancy suitings. The entire plant is expected to be in operation, with full complement of help, by Feb. 10th. The mills have been closed since last November.

*Massachusetts, Uxbridge. Davis & Brown, of Dayville, Conn., have secured control of the Royal Woolen Company's plant and have made arrangements whereby the mill will continue to be operated by Mr. Winfield Scott for Davis & Brown.

*New Jersey, Somerville. Matters are gradually being put in order so that the Somerville Woolen Mills, recently reported purchased by James Brown, Jr., may be started up with full capacity. About 100 people are now employed.

Pennsylvania, Doylestown. It is reported that Crossley Holmes of Philadelphia, has leased the Doylestown Worsted Mills and will put the plant, which has been idle of late, into operation. About 80 people will be employed.

Pennsylvania, New Bethlehem. The New Bethlehem Woolen Mills is a new company formed to operate the mills at this place, leased for the past six months by the Pittsburg Dry Goods Company. Operations will be started at once.

*Pennsylvania, Norristown. Operations have been resumed in the Coral Manufacturing Co.'s mill, recently damaged by fire.

*Rhode Island, Wickford. It is understood that Joseph E. Fletcher, who recently leased the Wickford Mills, expects to have the plant in operation by March 1st.

Mills Shutting Down.

Iowa, Lattner's. The woolen mill at this place has been closed owing to the death of the proprietor, Jacob Lattner, and the property is offered for sale.

*Pennsylvania, Harrisburg. The Harrisburg Woolen Company is reported to have failed. The plant has been closed indefinitely.

*Rhode Island, Wickford. The Wickford Worsted Mills, which have been running off stock on hand, will shut down the end of this week. It is reported that a six months' lease of the plant has been taken by Joseph F. Fletcher, of the Mapleville Mill, and that operations will be resumed within a few weeks.

For Knitting Mill News, see Knitting Department.

SILK.

New Mills.

*Connecticut, Middletown. The Merchants' Silk Company, recently reported organized with capital stock of $200,000, will operate the plant formerly run by the L. D. Brown & Son Company. Charles Reynolds, C. D. Leach and Leonard Markham are among the incorporators. Work will start shortly manufacturing silks.

New Jersey, Paterson. The Luvan Silk Company has been incorporated with capital stock of $50,000, with office at 220 Van Houten street. Samuel Nathan and John R. Van Blarcom are among the incorporators.

Pennsylvania, Philadelphia. Chas H. Fleming, well known to the dyeing trade, has started a dyehouse at Collins and Westmoreland Streets for dyeing hosiery. Reports business as good.

Enlargements and Improvements.

Connecticut, Norwalk. Thirty-six new looms have been installed in the Muller Gloria Mills

New Jersey, Oxford. A branch mill will be established here by the Singleton & Searing Silk Mill Company of Dover. Work will start at once on repairing the building to be occupied.

Pennsylvania, Allentown. The Phoenix Silk Manufacturing Co. is reported as negotiating for purchase of the Rodney property on which to erect another plant.

New Jersey, Paterson. The I. A. Hall Mill, which has been rebuilt, is being filled up with new tenants. Henry Doherty, who has space in the older part of the mill and in the Ward Street mills, has leased the two upper lofts, and will have a total of 550 looms in operation when all the machinery has been placed. The entire third floor has been leased by the Taylor Silk Co., at present located on Bridge St. Abraham D. Cohen will occupy the first floor. Here he will operate 60 broad silk looms. His plant is now in the Jenkinson Mill on North Second Street.

New York, Cortland. The Cortland Silk Company contemplates erecting a new building this summer. They now operate 40 looms and expect to have 50 in operation shortly.

Pennsylvania, Allentown. It is reported that the Joseph S. Mack Silk Co. contemplates building a new mill.

Pennsylvania, Hamburg. The Hamburg Silk Company will install 30 new looms in the mill.

Pennsylvania, Philadelphia. R. & H. Simon, manufacturers of silk goods and pile fabrics at Easton, Pa., it is reported, have leased the top floor,

containing 20,000 square feet, of the Pfingst Mill, Ontario and Kensington Ave. This new plant will be equipped with new machinery consisting of ribbon looms now being built by a prominent Philadelphia loom builder and will be installed at once. The plant will be run by electricity.

MISCELLANEOUS.

New Mills.

*Massachusetts, Barrowsville. Fred S. Hall (Taunton) is president of the Barrowsville Bleachery, recently incorporated with capital stock of $75,000; Franklin H. Downs (Lynn), treasurer, and Fred H. Hoadley (Providence, R. I.) secretary. Work has been started toward erection of an entirely new plant, which they propose having completed by September 1st, for bleaching, dyeing and finishing cotton cloth.

*Massachusetts, Methuen. The new mill for the Tekcips Dyeing & Finishing Company is nearing completion. A new 150 h. p. boiler has been installed, and a large number of the machines are being set up. It is expected that the plant will be ready to start up about the middle of March.

New York, New York. Charavay & Bodvin, silk finishers, 174 Worth street, have incorporated with capital stock of $100,000.

Enlargements and Improvements.

Rhode Island, Pawtucket. The Harrison Yarn & Dyeing Company has purchased site on Front Street, of about 15,000 feet, and will erect a new mill. The proposed building will be 140 by 100 feet, two stories high. When completed the machinery from the old plant will be removed and increased with about 25 per cent. additional.

Mills Shutting Down.

Illinois, Peoria. The Peoria Cordage Works will be closed in a few days for an indefinite time. It is thought that operations may be resumed in about three weeks. Inability to secure enough material is given as reason for shut down.

Massachusetts, New Bedford. The New Bedford Cordage Company's plant has been closed and will remain idle indefinitely. A meeting will be held shortly by special committee of the stockholders who will submit reorganization plan embodying views of the shareholders revealed in a previous meeting. The plant will either be mortgaged for enough to make up the difference between the appraised value of the quick assets and the total amount of the company's indebtedness, or else the stockholders will advance the difference out of their own funds, trusting to reimbursement either by continuation of business or liquidation on more advantageous terms than are possible in the present condition of the hemp and rope market.

FAILURES AND SUSPENSIONS.

Massachusetts, Taunton. Arthur S. Phillips, Robert A. Terry and William B. Edgar have been appointed receivers for the Watuppa Mills, whose new plant is in process of completion. Application for receivership was made by C. W. Holcomb, of New Bedford, a stockholder and creditor. It has been expected that the plant would be compelled to go under. Contractors, unable to secure payments as agreed, stopped work and machinery supplies were also cut off.

New Jersey, Trenton. Dick S. Ramsey (Brooklyn) and Frederick K. Bay (Elizabeth, N. J.) have been appointed receivers for the Standard Rope & Twine Co., on application of Geo. W. Montgomery, of New York.

North Carolina, Greensboro. J. A. Davidson has been appointed temporary receiver of the Hiawatha Manufacturing Company, upon petition made by Messrs. W. W. and Berry Davidson. Company's liabilities are placed at at $30,000; assets not yet given.

Ohio, Mechanicsburg. Mickle & Cheney, whose plant was destroyed by fire last year, have made an assignment for benefit of their creditors. E. E. Cheney, of Urbana, is the assignee.

FIRES.

Canada, Quebec, Sherbrooke. The Barnston Woolen Mill has been totally destroyed by fire. Unfinished goods valuing about $2,000 were also consumed. The loss, placed at about $10,000, is partially covered by insurance.

Connecticut, Norwich. The Jewett City Textile Novelty Company's plant has been destroyed by fire. The loss is placed at $80,000; carried insurance at $50,000.

New Hampshire, Laconia. H. B. Clow & Sons' mill has been totally destroyed by fire. The loss is estimated at about $78,000; insurance, $28,000.

Pennsylvania, Allentown. About $5,000 worth of damage has been done to the Lotte Bros.'s silk dye works. The loss is fully covered by insurance. The fire started in the laboratory.

Pennsylvania, Clifton Heights. The Columbus Knitting Mills were damaged by fire recently. Loss is placed at about $2,000; fully insured.

Pennsylvania, New Berlinville. The Fisher Woolen Mill has been destroyed by fire. The loss is placed at about $1,200, with no insurance.

Pennsylvania, Philadelphia. Fire on Monday night, the 13th inst., damaged the stock and machinery of Flanagan & Bros. mill, Walnut Lane, Roxborough, to the extent of $3,000. The blaze originated in the drying room.

Pennsylvania, Philadelphia. The Eagle Mills, formerly occupied by the late firm of James Hilton & Co., manufacturers of wool stock at Mechanic and Morton Sts., Germantown, which was almost destroyed by fire in March of 1904, and which is now occupied by W. W. Hitchon, who removed to this mill from Thorpe's Lane and 16th St., was again damaged by fire on the 28th of February to the extent of $3,000. Mr. Hitchon manufactured shoddies and cotton and woolen wastes on one set, the plant being run by steam.

Pennsylvania, Philadelphia. A fire in the Edgewater Print Works caused damage to the plant of about $15,000.

Pennsylvania, Shamokin. W. F. Taubel's hosiery mill has been destroyed by fire.

Pennsylvania, Shamokin. A fire which considerably damaged buildings in the business centre of this town entirely consumed the large knitting factory of I. W. Forry & Son, 33-35 N. 5th Street, in which they operated 200 knitters on boys' hose and men's half hose.

FACTS AND GOSSIP.

Alabama, Huntsville. The Madison Spinning Mill has been placed in the hands of Jas. K. Boyd, cashier of the Huntsville Bank & Trust Company, as receiver. Cooper & Foster are attorneys for the petitioners, all of whom are non-resident corporations. This company is capitalized at $300,000. It is thought that operations will be continued by the receiver for the benefit of the creditors.

*Alabama, Leeds. J. B. Elliott advises us that he is trying to induce cotton mills or any other industry to locate at Leeds or near vicinity, but that nothing definite has yet been done.

Alabama, Roanoke. The Wenobee Cotton Mills located near this place are to be sold. J. A. Williams of Lafayette is the receiver and will have charge of the sale.

Arkansas, Pine Bluff. W. T. Warwick is interested in starting a cotton mill at this place and is investigating the project.

Connecticut, Colchester. A. G. Turner is removing the machinery from mill at this place to plant at Turnerville.

Connecticut, East Hampton. It is reported that there is a possibility of the Star Net & Twine Company's plant being removed to Baltimore, Md., where the American Thread Co., which has acquired the above property, is erecting a new plant.

Connecticut, Oakdale. The Massasoit Manufacturing Company is making alterations to their plant which will more than double the present output.

Connecticut, South Norwalk. It is reported that an English concern is negotiating for a site upon which to erect a building costing not less than $10,000.

*Connecticut, Thompsonville. It is expected that the balance of the Higgins Carpet Company's plant at New York will be removed here before July 1st.

*Connecticut, Willimantic. The Windham Manufacturing Co. has not yet made any definite decision regarding the erection of a new weaving mill.

Georgia, Athens. It is reported that the owners of the Southern Mfg. Co. are interested in establishing a large linen mill there, with capital stock of $250,000. It is proposed having the plant in operation by next fall.

Georgia, Clarksville. J. E. Fenner, who formerly ran a hosiery mill in Rochdale and Spencer, Mass., called the People's Hosiery Mill and the Warp Knitting Mill, is now engaged in a project to start a colony of Christian people on co-operative plan at this place. They are all going to work for the common good and expect to raise all they need to eat from the land, and among other things would like to build a knitting mill to furnish work for the people. Mr. Fenner says that they expect to manufacture hosiery and underwear, and invites all true Christian people to assist him in any way that they can to get started.

Georgia, Greensboro. W. N. Overstreet is reported as interested in movement to establish a cotton mill here.

Georgia, Rome. J. N. King has purchased Wright Willingham and T. W. Lipscomb's interests in the Floyd Cotton Mills. These mills have recently been enlarged and new machinery installed.

Georgia, Vienna. P. G. McDonald is reported as interested in organizing a company with capital stock of $100,000, to build a cotton factory.

*Iowa, Shenandoah. A new building is to be erected for the Premier Hosiery Mills which will be removed to this place and operated under name of the Shenandoah Knitting Mills, for which a new company has been organized with capital of $30,000. The main building, 108 by 46 feet, two stories, with boiler house, engine room and dye house, 30 by 75 feet, one story. Paul F. Vogel is president and superintendent of the new company, Earl R. Ferguson, vice president, Arthur W. Jones, treasurer, Jesse B. Sutton, secretary. They will operate 60 knitting machines on men's seamless cotton half hose. Goods will be sold direct.

*Kentucky, Louisville. We have been advised by J. V. Reed & Co., recently reported as owners of the old Tarascon Woolen Mills, that they do not contemplate doing any work in this line at present.

Louisiana, Clinton. Efforts are being made to have the Clinton Cotton Mills, long idle, put in operation again. The Clinton Progressive Union is actively interested.

Maine, Brewer. It is reported that the Houlton (Me.) Woolen Mill contemplates starting a branch mill here.

Maryland, Baltimore. A new building, 110 by 25 feet, three stories, is to be erected for the Southern Embroidery Co.

Massachusetts, Ballardvale. The Ballardvale Mills Company has been incorporated with capital stock of $225,000 (1,000 shares preferred and 1,250 common, at par value of $100). They will continue making the same class of goods at the mill as heretofore. Wm. H. Hodgkins is president and treasurer of the company and Howell F. Wilson, vice-president. Cabot, Jones & Kelley will continue as the selling agents.

Massachusetts, Chapinville. The Northboro Woolen Mills have made repairs to the plant and are now running full time.

*Massachusetts, Dalton. Crane Bros., whose mill was totally destroyed by fire, with loss of $5,000, insurance $3,200, have not yet decided about rebuilding.

Massachusetts, Fall River. W. Frank Shove, treasurer of the Pocasset Mills and the Fall River Manufactory, has been elected to succeed William Evans as treasurer of the Wampanoag Mills.

*Massachusetts, Fall River. It is reported that all but $50,000 of the proposed new capital for the reorganization of the Davis Mills has been subscribed.

Massachusetts, Great Barrington. The Adams Woolen Mill power at Glendale, recently controlled by Morris Herman, has been purchased by Parley A. Russell. It is stated that there is now a prospect that the old Berkshire Woolen Mills at this place will soon be occupied, as a representative from Hudson has been looking at the plant with a view to leasing same for manufacturing first-class woolen blankets. It is reported that a company will be formed, providing about $15,000 of local capital be secured.

*Massachusetts, Holyoke. Work has been started by the W. H. H. Slack Company on removing the branch mill at this place to Springfield, Vt. Part of the machinery has been purchased by the Grosvenor Woolen Company, which contemplates resuming operations shortly.

*Massachusetts, Hudson. The machinery of the Hudson Blanket Company will be offered for sale at public auction, Friday, February 24th. H. E. Stowe, 197 Walnut St., Newtonville, Mass., has matter in charge.

Massachusetts, Jamaica Plain. John C. Meyer & Co. have moved their main office at 80 Kingston Street to the mill at Jamaica Plain. They will also have an office at 77 Summer Street and 475 Broadway, New York.

Massachusetts, Monson. S. F. Cushman's mill will be put in operation shortly, on a line of fancy goods. This plant has been idle some few months. A. A. Langwald will be superintendent and manager.

*Massachusetts, New Bedford. At meeting of the stockholders of the New Bedford Cordage Company held recently, it was voted to reduce the capital stock and reissue new stock (562 shares at $100 per share). Holders of present stock are entitled to subscribe to one share of preferred for every four shares of what will be the common.

*Massachusetts, North Adams. The Johnson-Dunbar Mills Company's property will be sold at public auction, March 17th. The mill properties are subject to a mortgage of $250,000.

*Massachusetts, North Adams. Lewis Squires, New York, trustee in bankruptcy of the Johnson-Dunbar Mills Company, has petitioned the United States Court for right to dispose of the property. He states that sale would be for the interest of all the creditors, secured or unsecured, as their interest would not be prejudiced by such a sale.

Massachusetts, North Chelmsford. The Geo. C. Moore Wool Scouring Mills have been incorporated with capital stock of $125,000, with William G. Brown (Lowell), president; Geo. C. Moore, treasurer. This is an incorporation of Geo. C. Moore's mill.

*Massachusetts. Spencer. Albert J. Palmer has purchased Thos. E. Curry's interest in the Taylor Woolen Company. Simon Taylor is president of the company and Arthur Monroe, treasurer.

Massachusetts, Springfield. The Hutchins Narrow Fabric Company has been petitioned into involuntary bankruptcy at the instance of three creditors, with aggregate claims of $20,514.32. This company's plant has been taken over by the Bond Manufacturing Company, about which detailed report has been previously given.

*Massachusetts, Uxbridge. At a meeting of the stockholders of the Calumet Woolen Company it was voted to authorize the directors to sell or lease all or any portion of the mills. If sold, the company will liquidate and go out of business. The Calumet mill has been closed for the past six months, but the Hecla plant, which is in operation, will continue until orders on hand are filled.

Massachusetts, Wales. The Golden Rod Woolen Company has been incorporated with capital stock of $30,000 to operate the Golden Rod Woolen Mill at this place. Joseph H. Louden is president of the company. Harrison H. Schaff, Geo. S. Foster and Geo. H. Priest are also interested.

Massachusetts, Webster. A new woolen mill, with capacity of 10 sets, will be erected this spring by Sydney K. Bartlett. The building will be brick and will be three stories high.

*Massachusetts, Westford. The Brookside Worsted Mills, recently incorporated with capital stock of $100,000, will continue the plant of Geo. C. Moore. As was previously reported Clifford A. Moore is president of the company; Geo. C. Moore, treasurer and Paul T. Wise, superintendent. Plant is equipped with 6 combs, 10 worsted cards and 5,000 worsted spindles for making worsted yarns, all counts up to 40s, using the Bradford system.

Massachusetts, Worcester. The American Card Clothing Co. has been reorganized under the laws of Massachusetts with capitalization of $105,000. Henry Ashworth of Fall River will be general manager.

Michigan, Detroit. The Armstrong Woolen Company has been incorporated with capital stock of $25,000.

*Mississippi, Hashuqua. The Hashuqua Mfg. Co.'s mill has been purchased by A. M. Tyne, of Shuqualak, and not Jackson, as was previously reported.

*Mississippi, Meridian. Eastern capitalists have made proposition to the Board of Trade for erection of a cotton mill at this place. They offer to furnish $250,000 toward capital, provided local capitalists invest $150,000 and organize a $400,000 stock company. L. Cohn, C. P. Weatherbee and H. G. Meyer are on committee appointed to solicit subscriptions.

*Mississippi, Meridian. The proposed cotton mill at this place has been organized as the Beatrice Cotton Mills, with capital stock of $400,000.

New Hampshire, Manchester. The Amoskeag Manufacturing Corporation has purchased the

plant formerly run by the A. P. Olzendam Company.

New Jersey, Hammonton. The Board of Trade is considering a proposition made by Philadelphia parties, manufacturing Turkish towels, curtains, etc., relative to removing their plant here. They ask for building with floor space of 10,000 square feet and payment of transportation charges.

New Jersey, Jersey City. The Foot Manufacturing Co., 36-40 Germania Ave., now operates a two set plant manufacturing wool felt specialties, in addition to brushes, felt polishing wheels, etc. A new one-story brick boiler house has recently been completed and equipped. They contemplate making other improvements during the year.

New Jersey, Passaic. The Davis & Catterall Company has been incorporated with capital stock of $125,000 for purpose of manufacturing cotton goods and other fabrics. Edward Davis, Adam Catterall and John Williamson are interested.

New Jersey, Paterson. The Demarest Silk Company has been incorporated with capital stock of $50,000 by Geo. W. E. Demarest, G. Demarest and I. M. Demarest.

New Jersey, Paterson. It is reported that parties have been looking at the old Todd Mill, at Taylor and Jackson streets, with view to securing same for a silk dveing and finishing plant.

New York, Clayville. It is reported that the property of the Empire Woolen Company, now idle, will be sold in the near future and that the plant and adjoining property will be bid in by Mr. Smith, the treasurer. While nothing definite has yet been decided upon, it is thought that Mr. Smith and other parties will eventually start up some kind of a woolen mill.

*New York, Delhi. The Delhi Silk Company has been incorporated with capital stock of $150,000, to continue the business of the Delhi Silk Mill. Among the incorporators are: Wright Smith (Paterson, N. J.), F. C. Gallant and W. M. Gallant.

New York, Hornellsville. It is stated that the First State Bank has become interested in the project for establishing a new silk factory here and has subscribed $500 toward the enterprise.

New York, Jamestown. The Broadhead Worsted Mills have removed the looms at the Meadowbrook Mills, Falconer, to the mills at this place. The company manufactures women's dress goods and men's wear.

*New York, New York. J. P. Nawrath & Co., recently reported incorporated, are wholesale dealers in twines, etc., and not manufacturers.

New York, Rochester. The Schaefer & Klein Manufacturing Company has been incorporated with capital stock of $10,000, to continue business of Schaeffer & Klein, manufacturers of trimmings.

New York, Watertown. The Valentine & Bentley Silk Company has recently issued $500,000 worth of bonds for purposes of erecting new mills, buying machinery, paying off indebtedness and supplying working capital.

New York, Watervliet. The Roy Woolen Mills are operating the entire plant, comprising the main mill, the old butt shop and mill No. 2.

*New York, Whallonsburgh. The new mill reported to be started here is the Empire State Mills, Inc., formerly located at Crown Point. The company, of which W. H. Spanswick is president and A. D. Smith, treasurer, has capital stock of $10,000. They will start operations April 1st, making ladies' Jersey ribbed underwear, operating 12 knitting and 20 sewing machines. Will use steam and water power and sell goods direct.

*North Carolina, Sylva. We have been advised by J. R. Love that although the matter has not yet taken any definite steps, it is more than probable that a knitting mill will be established now.

Ohio, Orrville. It is reported that a new mill, 110 by 60 feet, will be erected and equipped for manufacturing worsted yarns.

*Ohio, Upper Sandusky. We have been advised that there is nothing in report of Board of Trade considering proposition from a knit goods manufacturer relative to his removing plant here.

Oregon, Albany. The Bannockburn Manufacturing Company proposes increasing the capital stock for purpose of establishing a clothing factory in Portland, to cut up product of the mill.

Pennsylvania, Adamstown. Geo. W. Bollman and John A. Blankenbiller, operating the Blue Cross Knitting Co., have dissolved partnership. The business will be carried on by Mr. Bollman.

*Pennsylvania, Bloomsburg. We have been advised by E. C. Caswell & Co. that their plant was only partially destroyed by fire and that loss is placed at about $30,000. They have made all arrangements for new machinery, etc.

*Pennsylvania, Chester. The Standard Spinning Company's mill has been purchased by Joseph H. Parvin, of Parvin & Co., Philadelphia, for $31,500. The plant is now closed, but it is expected that operations will be resumed shortly under the new management.

Pennsylvania, Chester. The buildings, engines, dynamos, boilers and fixtures of the Chester Manufacturing Company's plant has been purchased at the recent sale of the plant, by F. W. Hammett, of Philadelphia, for $25,000, subject to a mortgage of $49,000 at 4 1/2 per cent. The machinery was sold in lots. The looms and other machinery of weave room No. 1 was secured by Walter S. Wright, and other machinery by Joseph Lamb.

Pennsylvania, Doylestown. It is reported that Drenk & Brewer will establish a hosiery mill at this place and a building has been leased for the purpose. It is expected to start operations about April.

Pennsylvania, Easton. It is reported that a large silk mill is to be erected on Lachenour Heights.

Pennsylvania, Philadelphia. The Oxford Silk Company has been incorporated with capital stock of $30,000.

Pennsylvania, Philadelphia. William F. Hogg and John Franklin Seavey who, about eight months ago, started the Durham Carpet Company

at 139-141 Oxford St., have dissolved partnership. The business in the future will be conducted by Mr. William F. Hogg, under the old name.

Pennsylvania, Philadelphia. The establishment of F. A. Bruner, recently adjudged a bankrupt by the courts, was sold at auction by the referee on February 6th. The plant, which was located at Unity and Leiper Streets, Frankford, contained 68 looms and other machinery for manufacturing upholstery goods, curtains, table covers and linen towels.

Pennsylvania, Philadelphia. One hundred hand knitters are being operated on low grade stockings at the Eastern Penitentiary, 21st St. and Fairmount Ave., the warden doing the buying. The goods are sold through agents in different parts of the country.

Pennsylvania, Philadelphia. The Tioga Dye Works, Schiller St., below Richmond, now being run under a partnership by John J. Kane and Patrick Morris, dyers of cotton and woolen skein yarns, has applied for a charter under the name of the Tioga Dye Works Co., the incorporators being John J. Kane, James Mees, and Thomas Shepherd.

*Pennsylvania, Scranton. At recent meeting of the stockholders of the Scranton Lace Curtain Company, the plan proposed by the board of directors, carried out in all details, has been approved by the stockholders. By this arrangement the finances of the company have been materially simplified and strengthened, and there is now but one class of bonds and one class of stock, where previously there had been two of each. The fixed charges have not in any way been increased. No action has yet been taken by the board to increase the capacity of the plant for the present, but the company is financially able to do so whenever the condition of the market so warrants.

Pennsylvania, Schuylkill Haven. One of the busiest plants in the Schuylkill Valley is the Schuylkill Haven Bleach & Dye Works, Samuel Rowland, proprietor. The plant is well equipped with the latest improved machinery. Mr. Rowland has enlarged the mill several times and expects to make further improvements in the near future. He makes a specialty of bleaching and dyeing knit goods and receives many orders from great distances. All work is guaranteed.

*Rhode Island, Woonsocket. The New England Edging Co., whose plant was completely destroyed by fire last December, contemplates resuming operations about August or September.

*Rhode Island, Woonsocket. Negotiations are now being carried on by different parties desirous of selling land for site of new mill proposed by Charles Thiberghien.

Pennsylvania, Wyomissing. It is reported that parties are negotiating with Geo. W. Heffelfinger for purchase of a suitable lot upon which to erect a large hosiery mill.

Rhode Island, Washington. The Spring Lake Mill No. 2, operated by A. H. Esten, is being operated with a night and day force.

Rhode Island, Woonsocket. The Morrill Knitting Company has changed its name to the Rathbun Knitting Company. Edward H. Rathbun is president of the company, Mark Hough, secretary and Geo. H. Emmott, treasurer and general manager.

*South Carolina, Camden. C. H. Yates has purchased the Camden Cotton Mills for $100,000. It is expected that a new company will be organized by Mr. Yates and associates and the mill started up to its full capacity.

*South Carolina, Iva. We have been advised by D. P. McBrayer that there is a project under way for building a cotton mill here, but that nothing has been done so far toward the enterprise.

South Carolina, Iva. It is reported that a project is underway for building a 10,000 spindle cotton mill at this place during the summer. T. C. Jackson and others are interested in soliciting subscriptions toward the enterprise. They have also interested D. P. McBrayer of the Riverside and Toxaway Mills, Anderson, in the project.

*South Carolina, Newberry. The Newberry Knitting Mill's property has been sold to T. C. Pool, for $15,000.

South Carolina, Seneca. L. O. King is reported as interested in establishing a knitting mill near this place.

Tennessee, Bristol. Messrs. Trigg & White of this place are reported as negotiating with capitalists contemplating erection of a large cotton mill early in the spring.

*Tennessee, Elizabethton. We have been advised by Messrs. Scott & Lacey that they contemplate organizing a company soon and may install an electric light plant and possibly later a small woolen mill for manufacturing hosiery yarn.

Tennessee, Elizabethton. Scott & Lacey of this place, owners of a valuable water power, propose developing same and establishing a woolen mill.

Tennessee, South Pittsburgh. It is reported that Messrs. Davis & Mathews, formerly proprietors of a plant at Chattanooga, contemplate starting a hosiery mill at this place.

Texas, Bryan. It is reported that John B. Hines of the Wesson Cotton Oil Company, Wesson, Miss., has made a proposition for erection of a cotton mill at this place.

*Texas, Denison. The Denison Cotton Mill will be offered for sale this month to satisfy judgments outstanding and to pay the bonded indebtedness outstanding against the company. It is reported that several parties have been looking at the property and that if purchased, the plant, now equipped for spinning only, will be equipped with looms also for weaving.

Texas, Gonzales. It is reported that the cotton mill which has been idle for some little time may be leased to C. A. Pender of Brenham, Texas. The matter is now under consideration.

Texas, McKinney. K. L. Tanner and Edward J. Tanner are reported as interested in locating a woolen mill here.

Texas, Sulphur Springs. It is reported that a movement is under way for establishing a cotton mill here. The Business League, which is interested, proposes forming a cotton mill company and inviting farmers and cotton growers to subscribe for stock and pay in cotton.

Virginia, Martinsville. Hugh N. Dyer of this place is reported as interested in corresponding with builders of woolen machinery.

Wisconsin, Milwaukee. The M. L. Williamson Company has been incorporated with capital stock of $5,000 to manufacture underwear. M. L. Williamson, W. D. Hickman and Arthur W. Fairchild are interested.

Personals.

PERSONALS.

Cotton.

William B. Orr, superintendent of the Renfrew Grove and Broadley Mills, has been appointed general superintendent of all the Renfrew Manufacturing Co.'s Mills, Adams, Mass., succeeding J. N. Sanderson, who has been appointed general agent. Charles Thompson, superintendent of No. 5 mill, will be Mr. Orr's assistant.

Stephen Conway has succeeded John A. Cronin as overseer of carding on cotton rope yarns for John F. Bailey & Co., Philadelphia, Pa.

William L. Jenkins has resigned as overseer of carding at the American Thread Mills, Willimantic, Conn., and taken the position of superintendent of the Bennett Mills, New Bedford, Mass.

Arthur F. McBrinn has succeeded Mr. Oswald as overseer of spooling, warping and twisting at the Hebronville (Mass.) Mfg. Co.

Charles Burgess, overseer of weaving at the Corr Mill, Taunton, Mass., has resigned, to accept a similar position at the Bristol Mill at New Bedford, Mass.

N. E. Gregory, formerly overseer in the Saint Croix Cotton Mill, has accepted the position of overseer in a mill at Manchester, N. H., where he will take charge of upwards of 1,300 looms.

Ernest Hall, who was recently in the office of Eldredge, Lewis & Co., Boston, has accepted a position as designer with the Brockton Webbing Co., and entered upon his new duties.

S. B. Sargent, superintendent of the Royal Bag & Yarn Mfg. Co., Charleston, S. C., has recently accepted a position as general manager of Mr. D. A. Tompkins' various interests, and expects to assume his new business about the middle of April.

John M. Jackson of Nashua, N. H., has engaged as overseer of napping with the Chicopee Mfg. Co., Chicopee Falls, Mass.

The Roberdel Mfg. Co., Rockingham, N. C., are replacing a number of their roller cards with revolving top flat cards ordered from the Howard & Bullough American Machine Co., Pawtucket, R. I.

L. W. Buck has resigned as superintendent of the Southern Cotton Mills, Bessemer City, N. C. His successor is W. H. Ray.

P. M. Grimes, superintendent of the Atherton Mills at Charlotte, N. C., has resigned and accepted the superintendency of the Milstead Mfg. Co., Conyers, Ga.

Charles S. Billings has resigned as superintendent of the spool manufacturing department of the American Thread Company, Willimantic, Conn., on account of ill health. R. L. Higgins, who has been his foreman for 25 years, succeeds him.

Peter Flynn is the new superintendent of the Hamlet Textile Company's mill at Woonsocket, R. I. He succeeded Frederick Ott, who resigned some time ago. Mr. Flynn has been overseer of the Newmarket Mfg. Co. at Newmarket, N. H.

The Lincoln Cotton Mills, Southside, N. C., which recently changed hands, have placed with the Howard & Bullough American Machine Co., Pawtucket, R. I., a repeat order for revolving flat cards.

Charles N. Bagley has resigned as superintendent of the Jefferson (Mass.) Woolen Co.

Col. T. E. Moore of Tucapau, S. C., has been elected president of the Gaffney, S. C., Manufacturing Co., to succeed H. D. Wheat, who resigned recently to give all his attention to the Irene Cotton Mills, at Gaffney, recently incorporated.

The Howard & Bullough American Machine Co., Pawtucket, R. I., have just completed extensive additions to their plant, made necessary by the increased demand for their product, which consists of a full line of picking, card room, spinning and twisting machinery. This shop is busy with orders lately placed by some of the leading mills both in the South and New England.

J. W. Hogan has resigned as superintendent of the Winder (Ga.) Cotton Mills and accepted a similar position in Greenville, S. C.

Frank F. Woolley of Pawtucket, R. I., has been appointed superintendent of the mills of the Coventry Company, Anthony, R. I., to succeed Herbert L. Strait, who resigned two months ago on account of ill health.

J. L. Davidson has resigned as superintendent of the Madison Manufacturing Company, Huntsville, Ala. He is succeeded by C. F. Massey, late with Dallas Mfg. Co.

Victor A. Bartlett of Lowell, Mass., is now with the Chicopee Mfg. Co., Chicopee Falls, Mass., in the position of second hand of cloth room.

John S. Pye, superintendent of the Willimantic Cotton Mills, Willimantic, Conn., has retired after eight years of service with that company. He was presented with a gold watch and chain by the em-

ployees. J. L. Burton of Newmarket, N. H., has succeeded him.

Woolen.

Richard A. O'Donnell of Oakland, Me., has accepted a position as boss dyer at Scott's Mill, Saugus, Mass.

M. J. Nelson, Providence, R. I., is now finisher with the Yantic Woolen Mills, Yantic, Conn.

Fred Marvin has accepted the position of overseer in the burling and spooling room in the Sutton Mill, North Andover, Mass.

Mr. Whitehouse, of Tilton, N. H., has taken the position of superintendent at the Massasoit Woolen Mills, Huntington, Mass.

John E. Lyon, formerly overseer of the Johnson-Dunbar Mills, has accepted a position as superintendent of the beaming and yarn department with the Peck Mfg. Co., Pittsfield, Mass.

J. P. McAfee, manager of the Western Woolen Mill in North Topeka, Kans., was presented by the employees of the mill with an elaborate Knights Templar watch charm set with diamonds. Mr. McAfee will leave shortly for Kansas City, Mo., to accept the position of manager of a new woolen mill to be built there.

George Humphrey, treasurer of the Pontoosuc Woolen Co., Pittsfield, Mass., has resigned. Henry A. Francis has succeeded him. Mr. Humphrey has been with the company for the past 25 years.

M. A. Boss, who has been master mechanic for the Calumet Woolen Co., Uxbridge, Mass., for the past 25 years, has closed his labors there on account of the company going out of business.

Thomas Rawley, of Putnam, Conn., has succeeded W. H. Buckley as superintendent of the mills of the Rochester Woolen Co., Rochester, N. Y.

C. E. Williamson has resigned as secondhand of finishing at Ray Mills, American Woolen Co., Franklin, Mass., to take charge of the finishing department of the new Schuster Woolen Company, East Douglas, Mass.

John McElwain, overseer of dyeing at the Sutton Mill, Andover, Mass., has resigned, to accept a position at the Beaver Brook Mill of the American Woolen Co., Collinsville, Mass.

Clovis Heneault has begun his duties as boss dyer in the new mill of the Dunn Worsted Company, Woonsocket, R. I. Harry Silvey will be his second hand.

John Hodgdon, overseer of the Atlantic Mills in Olneyville, R. I., has resigned his position and gone to Philadelphia, Pa., where he has been appointed assistant superintendent of the large Continental Worsted Mills.

The Knoxville Woolen Mills, Knoxville, Tenn., have placed a repeat order for revolving flat cards. These machines will be built by the Howard & Bullough American Machine Co., Pawtucket, R. I.

Joshua Woodhead has resigned as overseer of drawing, spinning and twisting for Folwell Bros. & Co., Philadelphia, Pa. He has purchased a business of his own which, however, has no connection with textiles.

Joseph S. Barnett, of Philadelphia, is the overseer of carding in the mill which Thomas J. West & Son, West Conshohocken, Pa., has just placed in operation, which is the former plant of the Geo. McFarland Co., containing eight sets of woolen machinery.

Frederick E. Hunter, assistant superintendent of the Hartford Carpet Corporation, Thompsonville, Conn., has resigned. Mr. Hunter entered the employ of the company as bookkeeper, when a boy, about 25 years ago. He rapidly arose to the position of head bookkeeper, and later to that of paymaster, and when the old company consolidated with the Higgins Carpet Company, he was made assistant superintendent.

Frank H. Appleby, formerly superintendent of the Spring Grove Mill at Chepachet, R. I., has accepted a position as superintendent and designer for the Elmville Woolen Mill, Danielson, Conn.

Lees Mallinson, overseer of the finishing department in the Coronet Worsted Company's mill at Mapleville, has resigned and was presented with a handsome clock by the employees in that department.

John McElwain has resigned as overseer of the dyeing department in Sutton Mills, North Andover, Mass. He has accepted a position with the Beaver Brook Mills, Collinsville, Mass.

James W. Powers has been engaged as overseer of dressing at the woolen mill of W. E. Hoyle, West Millbury, Mass.

Moses Spencer has secured the position of overseer of drawing and spinning in the worsted department of the Atlantic Mills, Providence, R. I. William McCloud has resigned as overseer of the drying department, and John Broadbent as overseer of the slashing and warping departments at the mills.

David Glass, for many years assistant superintendent for Howarth & Son, at their mill in Oxford, has taken the position of superintendent of the Geo. W. Olney Woolen Co., Cherry Valley, Mass., succeeding Thomas Olney, who died in October.

Ephraim Hodgson, for a number of years superintendent of the Newichawanick Company, South Berwick, Me., has resigned.

Albert Williams of Lowell, Mass., has succeeded M. K. Stillman as overseer of weaving at the Vassalboro (Me.) Woolen Mills.

Alexander Wilson has succeeded Charles Harion as overseer of carding for Richard Hall, carpet yarn manufacturer at West Manayunk, Pa.

O. Hall, designer at the Scotia Worsted Mills, Woonsocket, R. I., has resigned.

Frank Wood has resigned as boss finisher in Dunn's No. 1 mill, Woonsocket, R. I., to take charge of the piece dye department of the No. 2 mill. M. P. Fallon of North Adams succeeds Mr. Wood in the No. 1 mill.

E. Steward succeeds J. P. Callison as dyer at the Warren Mfg. Co.'s mill, Stafford Springs, Conn. Mr. Callison is the new dyer at the Blackinton Mfg. Co., Blackinton, Mass.

E. G. Tainter has been made overseer of finishing for the Mayo Woolen Company, Millbury, Mass.

Silk.

Peter Flynn, who resigned as overseer of the silk department of the mills of the Newmarket Mfg. Co., Newmarket, N. H., to accept the superintendency of a mill at Woonsocket, R. I., was presented with a valuable gold watch by the help in his department. Joseph Carter has taken the position made vacant by Mr. Flynn.

Deaths.

Louis E. Mack, of the Somerset Manufacturing Company, Raritan, N. J., died January 19. He was a son of Adolph Mack, president of the Raritan Woolen Mills. His death was due to a serious operation performed two days previous.

John B. Talcott, president of the American Hosiery Co., New Britain, Conn., and a former mayor of New Britain, Conn., died February 21st. He was 80 years old.

James A. Walsh, agent of the Lewiston (Me.) Bleachery and Dye Works, died at his home in that city. He began in this mill as shipping clerk and worked his way up until 12 years ago he succeeded Mr. Dempsey as agent.

Francis A. Goodhue, who has been identified with the aniline and dyestuff business for many years, died recently. Mr. Goodhue started in as a boy with the firm of Pickhardt & Kuttroff, and succeeded Mr. Miles with the Farbenfabriken of Elberfeld Co., when the latter company commenced business under the firm name of E. Sehlbach & Co., as their New England manager, and continued in that capacity until his sudden death, in his office at 32 India St., from a stroke of apoplexy. He is survived by a wife, one daughter and two sons. Mr. Peitzel, nephew of Mr. Muurling, the resident agent of the Farbenfabriken Co. in America, is now in charge of the Boston office.

R. O. Pockard, superintendent of the Wilson Cotton Mills at Wilson, N. C., was shot and killed February 16th in the spinning room at the mill.

Thomas M. Norris, a nephew of the late Col. D. K. Norris, president of the Norris Cotton Mill at Cateechee and the Issaqueena Cotton Mill at Central, S. C., has been elected president of the former mill, and R. G. Gaines has been elected president of the Issaqueena Mills.

Frank Bottomly, formerly a prosperous Athol, Mass., shoddy manufacturer, died at the home of his son in Chester, Conn. He was in his 87th year.

Asa A. Wescott died in Jacksonville, Fla., recently, where he had gone the latter part of January for his health. He was 78 years old. Mr. Wescott was one of the largest manufacturers of spindles in New England for many years, and retired in 1900.

George C. Howard, proprietor of the Howard Machine Works at Lansdowne, Pa., died January 14th, at his home in that borough. He was an inventor and apparatus designed by him is in use in many carpet mills and factories in various lines of industry. For Toppan, Carpenter & Co., Mr. Howard made the perforating machines for separating stamps, also plate printing presses. These were operated later by power, and used in the Bureau of Engraving and Printing at Washington. In 1861 he was selected to build the trimming and separating machinery for cutting the United States Treasury notes.

William Clegg, a retired woolen manufacturer, Philadelphia, Pa., died at his home, after a long illness. He was 76 years old. His wife, three sons and a daughter survive him.

J. B. Henderson, manager of the Penman Company at Paris, Ont., died January 21. Mr. Henderson has been in poor health for a couple of years. He was born in Paris, Ont., fifty years ago and lived there all his life, except about fifteen years ago, when he operated a woolen mill at Thorold.

Thomas Rowan, for many years overseer of sewing and burling departments of the Paramount Worsted Mills, Providence, R. I., died recently.

Col. Benjamin C. Dean, former superintendent of the Manchester Print Works, Manchester, N. H., died recently at the Hotel Lenox, Boston. Col. Dean was a native of Lowell and was 61 years old. He was a graduate of Brown University, and subsequently studied law and was admitted to the bar of Massachusetts. He went to Manchester nearly thirty years ago and during the fifteen years of his residence there took an active part in the business and social life of the city.

Edward H. Mullin, confidential representative of President Coffin of the General Electric Company, died at his home in Millburn, N. J., recently, aged 45 years. Mr. Mullin went to New York in 1881, and was engaged for several years in newspaper work. His connection with the General Electric Co. began in 1898, and in later years he was in charge of the advertising department with offices of the company in that city.

John H. Smith, a pioneer shoddy manufacturer of Little Falls, N. Y., died recently. Mr. Smith was born in England in 1832, and came to this country in 1836 with his parents. In 1860 he engaged in the manufacture of wool shoddies, continuing in the business up to the time of his death, excepting about nine years.

Thomas Dowd, superintendent of the Maline Underwear Mills, Winston-Salem, N. C., died February 6, at the age of 39 years.

James Leech, for many years superintendent of the Mechanical Fabric Company of Providence, R. I., died recently. Mr. Leech was one of the authorities on the manufacture of card clothing in this section of the country, having been engaged in that pursuit for himself and directing the work for others ever since coming to America, nearly 40 years ago. He was born in England in 1840, being in his 65th year at the time of his death.

New Publications.

[Any work noticed under this head can be obtained through the office of this journal.]

Design in Textile Fabrics; by Thomas R. Ashenhurst; Cassell & Co., London. Price $1.50.

The author places before the reader briefly yet thoroughly the principles of design in textile fabbrics, including the structure and decoration of cloths. Following is an outline of the table of contents: Textile Fabrics and Their Uses; Structure of Threads; Ornamentation of Fabrics; Stripes, Checks, Double and Figured Cloths; Gauze and Pile Fabrics.

Dressing, Weaving and Finishing (Theorie und Praxis der mechanischen Weberei, Vorbereitung und Warenappretur); by Hermann Dornig, Greiz, Germany. Price $2.

This is a practical handbook written for the use of overseers and superintendents in textile mills. It treats of warp preparation, weaving and finishing. While all parts of the work are written with the same care and attention to detail the section on finishing is of special value to American readers because the processes are applicable to American practice with fewer exceptions than are found in the case of warp preparation and weaving. A wide variety of fabrics are treated including cotton, woolen and linen. The text is in German.

Theory and Practice of Power Weaving, Preparation of Yarn for Weaving, and Cloth Finishing (Theorie und Praxis der Mechanischen Weberi, Vorbereitung und Warenappretur); by Herman Dornig, Overseer of Weaving, Greiz, Germany. Price, $2.50.

Beginning with a brief but interesting historical sketch of the textile industry, the author takes up in succession the following subjects: Preparation for weaving; preparatory machinery; mounting power looms; protector rod adjustment: smashes; regulating stroke of picker stick; shuttle changing device; adjusting shed; jacquard apparatus; general remarks on care and running of the loom; calculating gears; diameters and revolutions of pulleys; finishing cloth.

Each of these subjects is treated in a very practical manner. Pure theory is eliminated and although referring to German looms and practice, American manufacturers can find much valuable information regarding their own work.

The chapter on finishing treats of cotton, woolen, worsted, linen and mixed goods, giving recipes and directions for handling goods to obtain different effects. The text is in German.

Apparatus for the Control of the Warp in Power Looms (Die Kettenschaltgetriebe am mechanischen Webstuhle); by Siegmund Edelstein; Richard Dietze, Berlin. Price $2.50.

This is a scientific treatise on apparatus for the control of the warp in power looms. Its technical character makes it unsuitable for the use of the mill operative, but the loom builder will doubtless find much in it of value to him in the construction of power looms.

Dyeing Machines (Die Apparatefaerberei); by Dr. Gustav Uilmann; 245 pages, 5 by 8 inches; 128 illustrations; Julius Springer. Berlin, Germany. Price $2.50.

This work contains a classified description of the various dyeing machines used for coloring textile materials. It is profusely illustrated with drawings and perspective views of the different machines and gives a description of each. The author first takes up the machines in which the material is held between perforated plates, then the machines in which the stock is wound on cops or spools. The second part of the book relates to the general use of dyeing machines, and has important chapters on bleaching, drying, dyes, sulphur dyes, basic dyes, modern dyes, indigo and developed dyes for cotton. Jute and wool are treated in separate chapters, as are also the extracting and drying of the material. In conclusion the author summarizes the advantages and disadvantages of dyeing textile material in different stages of manufacture. The text is in German and dyers will find it a very valuable book.

The Cotton Question from the Standpoint of German Interests (Die Baumwollfrage vom Standpunkt deutscher Interessen); by Dr. August Etienne; J. Guttentag, Berlin, Germany. Price $1.25.

People in America cannot realize the deep interest which Europe is taking in the cotton question, or its vital importance in the development of European industries. It is said that the consumption of sulphuric acid measures the degree of civilization of a nation and perhaps the consumption of cotton is an even better standard of civilization. The first step in uplifting the savage is to clothe him with cotton cloth, and every succeeding step is accompanied by an increase of either the quantity or quality of cotton fabrics he requires. While the cotton question has been the subject of extensive discussion in Europe, Dr. Etienne's work contains much that is new and all of it is systematically arranged so as to bring out the main points of the problem. The six divisions of the book are devoted to the following subjects: 1. The need of cotton and the struggle for it. 2. The culture and export of cotton. 3. Present state of the cotton agitation in Germany. 4. International Union of cotton consumers. 5. Field for the promotion of cotton culture in Germany. 6. National organization for the promotion of cotton culture.

The Necessity for Improvements in Women's Dress (Die Verbesserung der Frauenkleidung eine Notwendigkeit). Price 50 cents.

Within the last few years a movement has been on foot in Germany for the improvement in the dress worn by women. In order to rouse interest in the cause organizations have been formed in many German cities. These have been very active in exposing the faults of the old styles of dress and gaining converts to the new process. The present pamphlet has been published by the Cologne association. It sums up all the reasons for reform both from a hygienic and esthetic point of view and also gives instructions for the manufacture of the new clothing.

Business Literature.

Murray-Corliss Engines; the Murray Iron Works Co., Burlington, Iowa.

A striking exhibit is made by four books containing facsimiles of letters from users of the Murray-Corliss engines. Three of the books relate to oil mills, electrical works and flour mills respectively, while the fourth includes letters from a wide variety of trades. Reading these letters is like listening to the words of practical men who have used the Murray engines and are telling the reader how it has answered their requirements. The letters are presented in their original form, as the photographic process allows no change, and the reader is, therefore, certain that he is reading the exact words of the letter writer. It is interesting to note the various reasons advanced for recommending the Murray engine. The large number of letters and the wide variety of products represented make the collection the most emphatic endorsement of a mechanical device that we have ever seen. Copies will be mailed to anyone interested on application to the Murray Iron Works, Burlington, Iowa.

Cotton Dyeing; Leopold Cassella & Company, New York.

A second volume of "The Dyeing of Cotton and other Vegetable Fibres," as a supplement to the first volume. We announced in this paper, in May, 1903, the appearance of this earlier work and gave a general description of its contents.

The many new additions to the list of colors and the rapid progress made in the different dyeing processes have necessitated the appearance of this supplementary volume. Like the first, it is divided into a general and a special part, the first containing a full description of the properties and application, with dyeings on cotton serge, of all the Immedial and Diamine colors brought out by this firm since the publication of the original book.

In the second part, the application of all these new dyestuffs on loose cotton, cotton yarn, sliver, cheeses, cops and yarn in the hank in dyeing machines, on cotton warps, piece goods, hosiery, on linen yarn, linen and half-linen piece goods, ramie, jute and cocoanut fibre and artificial silk, is fully covered. In this part are likewise shown several cuts of useful machines which are recommended for use in the dyeing of the various materials mentioned.

Special chapters are devoted to the dyeing of cotton fabrics containing silk effect threads and woolen effect threads or borders, and the colors suitable for dyeing this class of materials are enumerated. In short, the volume is one of the most interesting and useful lately issued in this branch of industry. The book is now ready for distribution and any one interested may obtain a copy by applying to the Cassella Color Company, 182 Front Street, New York, or any of its branch offices.

Cotton and Woolen Spinning Machines; John Hetherington & Sons, Manchester, England; Stephen C. Lowe, Boston, American agent.

In addition to a description of the Hetherington combing, drawing and spinning machinery this book contains a large amount of technical information arranged in convenient form for reference. Every carding and spinning overseer will find the book of great value.

Electrical Catechism; National Electric Co., Milwaukee, Wis.

We have received the first instalment of an electrical catechism which is to be distributed without charge by the National Electric Company. The questions begin with the first principles of electricity and are to lead eventually to more advanced branches of the subject. This is an excellent means of imparting information and we advise all our readers who are interested in the subject to apply to the National Electric Co. to be placed on their mailing list to receive a copy of the catechism.

Heating and Ventilation; The New York Blower Company.

A new sectional catalogue, No. 55, on heating and ventilation. It contains a full description of the different styles of a new heater, shows some of the different styles of hot blast apparatus and several applications of this company's heating and ventilating system.

The catalogue may be obtained by writing to 25th Place and Stewart Ave., Chicago, Ill.

Lord's List of Trade Papers.

The Lord Advertising Agency, of Scranton, Pa., has compiled for the convenience of trade paper advertisers a list of the more important publications of advertising value to manufacturers of machinery, appliances and materials, used in technical industries. It contains the information which a prospective advertiser would wish to know, giving general characteristics of the paper, rates, claimed circulation and other data. The introductory treatise on trade paper advertising is one of the most sensible articles in this line that we recall. It is well worth the reading of any advertiser who is at present using or is contemplating using advertising space. It contains a great deal of sound common sense and information.

Philadelphia Textile School.

The firm of A. B. Kirschbaum & Company have established a system of scholarships in the Philadelphia Textile School, a scholarship to be awarded at the close of each school year to that member of the freshman class who has made the best record in the year's work, the scholarship to be good, if properly renewed, and if the student's record remains satisfactory, for the remaining two years of the regular course. Not only is the establishment of these scholarships of importance in itself, but it is, moreover, especially significant implying, as it does, a warm recognition of the value of this school on the part of one of the largest and most important firms in the clothing business in this country. This is but the most recent recognition of the service that this institution is performing for the textile industries of America that has come from practical business men, a kind of recognition which is the most gratifying and authoritative that could be received.

oluble Softening Oil.

The Arabol Mfg. Co., 100 William St., New York, are manufacturing what they claim to be one of the finest softening or sizing oils on the market and superior to tallow. They state that manufacturers like it because it is easy to handle, is always reliable and not influenced by temperature. It gives a smooth finish to the warps, the threads divide well in the lease rods, and the cylinders of the slasher remain perfectly clean. It is neutral and most suitable for strong and close woven goods, such as corduroys, velveteens, sateens, twills, umbrella cloths, cambric, warp, etc.

English Card Clothing in America.

The advent of C. Cain, Son & Greenwood, card clothing manufacturers of Halifax, England, in the American trade is an event of more than usual interest. The L. M. Bowes Company, 451 Atlantic Ave., Boston, Mass., are the American agents for this firm who are the largest manufacturers of card clothing outside the English card clothing combination. Until recently they have been unable to fill American orders owing to the fact that their facilities were fully taxed by the English and Continental demand. Within a few months, however, they have purchased the Henry Highley card clothing factory at Halifax, and equipped it with new machinery throughout to meet the increasing demand for their products and to give additional capacity for supplying the American trade. Messrs. C. Cain Son, & Greenwood's card clothing is well known to cotton, worsted and woolen manufacturers throughout the world. There is every reason to believe this high grade card clothing will meet with as much favor in America as in foreign mills.

Change in Management.

A change has been made in the management of the Textile Machinery Co., Boston, manufacturers of the Dunn flyer. Philip R. Hovey, former treasurer and director, also Messrs. George H. Hobson, Arthur L. Jacobs and W. B. Clark, directors, have resigned, their places being filled by Everett Carlton of the Carlton Woolen Mills, Rochdale, Mass.; Percy Hall of the F. A. & P. Hall Flyer & Spindle Works, Lawrence, Mass., and William B. Hallett of Hallett Bros. Company, paper dealers, Boston, who have become financially interested in the company, the latter having been elected treasurer and secretary. J. A. V. Smith of Manchester, N. H., the flyer manufacturer, and Fay H. Martin remain on the Board of Directors. The company's office has been removed from 50 State St. to 103 Bedford St., Boston.

Election of Officers.

The following have been elected officers by the American Soap & Washoline Co., Cohoes, N. Y.: Hugh Graham, president and treasurer; Eugene A. Graham, secretary; Charles G. Andrae, manager. The above also form the Board of Directors.

Walter F. Sykes & Company.

The co-partnership hitherto existing between Messrs. Walter F. Sykes and Robert R. Street, under the firm name of Sykes & Street, has been dissolved by mutual consent, Mr. Street retiring. The business will be continued by Mr. Sykes under the firm name of Walter F. Sykes & Co., importers and dealers in dyestuffs and chemicals, with branch offices in Boston and in Philadelphia, the latter office conducted under the name of Sykes & Hall.

Mill Engineering.

Adolph Suck, mill architect and engineer, 179 Summer St., Boston, Mass., has issued a folder showing illustrations of various works planned by him and now under construction. He makes a specialty of textile mill engineering and is able to give prompt and satisfactory service to his clients. He has branch offices at Asheville, N. C., and Los Angeles, Cal. A copy of the circular can be obtained upon application to the Boston office.

E. Jenckes Mfg. Co.'s New Philadelphia Office.

The E. Jenckes Mfg. Co., whose main office and factory are in Pawtucket, R. I., and who have hitherto had a Philadelphia office at the Bourse Building, have been obliged to move, on account of their rapidly increasing business, to quarters where they have larger office and show room accommodations. Their Philadelphia office is now located in the Schenck Building, 6th and Arch Sts., with entrances at 101 North 6th St., where they will have Invincible machines of various gauges in operation at all times. They will have machines fitted with attachments for making high spliced heel and double sole goods, also with yarn changing, striping, plating and white foot attachments. The Invincible machine is now furnished either as a bench machine or on a base, as may be desired. The knitting trade in general is invited to call at the new office and show rooms and examine this machine in operation and get full information about the "Knitter that Knits."

Distinguishing Cotton and Flax.

A small piece (about 1 inch square) is cut out of the sample of cloth under examination, and the edges are fringed. The piece is then put into a lukewarm alcoholic solution of cyanine and left there for some minutes. It is then washed in water and treated with dilute sulphuric acid. By this means the cotton is completely decolorized, while the flax fibre retains a distinct blue coloration. The coloration is due to the presence on the fibre of fragments of epidermis from the flax stalk, which greedily absorb the cyanine dyestuff. To render the blue still more distinct, the material is washed free from sulphuric acid, and placed in ammonia.—Zeitsch. f. Farben. und Text. Ind.

Inquiry for Textile Machinery.

In a recent conversation, the viceroy of the Liangkiang provinces informed me that he was much interested in American machinery and especially that for the manufacture by hand or steam power of tape, braids, embroidered and plain ribbons, etc., and he requested me to secure for him catalogues and other particulars regarding such machinery manufactured in the United States. It is apparently his intention to endeavor to introduce this machinery here on a large scale. Catalogues, etc., can be transmitted to this office in duplicate and one copy will then be transmitted to the viceroy.—Wilbur T. Gracey, Vice-Consul in Charge, Nankin, China.

Electric Power in Cotton Mills.

The Westinghouse Electric & Manufacturing Company have just closed a contract for electrical equipment for another large cotton mill, that of the Dwight Manufacturing Company, of Chicopee, Mass.

The Dwight Manufacturing Company manufacture sheetings, shirtings and fine dress goods. It has an equipment of upwards of 130,000 spindles, comprising both ring spindles and mule spindles, and about 3,500 looms. The machinery is at the present time driven by water and steam, the water power being supplied from the Chicopee River, on which the mill is located. The present power equipment consists of eight different water wheels, situated in various parts of the plant and connected to lines of shafting. To supplement this power in times of low water, and in fact to add additional power which cannot be obtained from the water power, there are installed three separate steam engines. Owing to the increased development of the mill, the amount of power installed has been insufficient and it has been deemed advisable to increase the power plant by installing electric power, it being intended to operate a portion of the mill continuously by motors, and other parts to be operated by electric drive in case of low water.

The factory is divided into a number of buildings arranged in crescent form along the river. The advantages of electric drive is, therefore, especially marked. The electric power plant will be centrally located and the lines will extend in both directions to the various buildings. The present contract provides for the following apparatus to be delivered and erected by the Westinghouse Company: One 440 volt, A. C. generator, 900 k.w. rated capacity, to supply three-phase current at a frequency of 60 cycles (This generator is to be direct-connected to a C. & G. Cooper 26 and 52 in. by 48 in. stroke cross compounding condensing); one 25 k.w. exciter, direct connected to Westinghouse engine; and one 22 1/2 k.w. motor driven exciter. There will also be provided a four-panel switchboard to control generator, exciters and six feeders.

The electric power plant is to be placed in a new building to be built as an addition to one of the present engine houses; in this way putting the two engines under the supervision of one engineer. To utilize the current produced by this plant the following Westinghouse type C motors wound for 60 cycles, three-phase, will be located in the various parts of the mill. Two 200 h. p. 580 R.P.M.; six 100 h. p. 580 R. P. M.; three 75 h. p. 690 R.P.M.; three 50 h. p. 850 R.P.M.; two 40 h. p. 850 R.P.M.

The Westinghouse commercial engineers have made a steady advance along the lines of electric driving of industrial machinery and this factory will add one more to their notable installations. The complete equipment of the new plant is from the plans of Lockwood, Greene & Company, of Boston.

The Carnegie Institute at Pittsburg.

The extensions to the building of this institution are rapidly nearing completion. They represent an expenditure of $5,000,000, the gift of Andrew Carnegie. The new building almost obscures the original structure, which cost $3,000,000, a previous gift of Mr. Carnegie. It occupies a width of 400 feet in Forbes Street and a depth of 600 feet.

In addition to the portion devoted to the library, comprised within its walls are to be found art galleries, a museum, a music hall, a lecture hall, a restaurant and the general offices required for the supervision and operation of these many divisions.

The scheme of workmanship is based on a very high standard. The architects, Alden & Harlow, having based their designs on the leading institutions of this type, both in Europe and this country.

The heating and lighting plant when completed will form a very interesting example of an installation that both in workmanship and appearance will be of very high quality, the specifications on these points being very rigid.

The contract for the electric generators has been let to the National Electric Company, Milwaukee. It consists of five 300 k. w., 120 rev. per min., 12 pole, 125 volt, direct current engine type generators. These machines will be of the latest design and best material, of massive though pleasing appearance, the heaviness in outline being relieved by the elliptical section of the frame. All visible bolts will be nickel plated and the field coils taped on the outside and finished with a wrapping of fish net cord. The terminal boards will be of Vermont marble. The total net weight of each generator will be about 55,000 pounds, the armature and commutator accounting for 18,000 pounds. On the final test the generators will be expected to withstand a momentary overload of 75 per cent. without flashing and to operate from no-load to 25 per cent. overload without shifting the brushes.

A Trial of Albany Grease.

Adam Cook's Sons, the only makers of Albany grease, 313 West Street, New York City, recently sent some samples of their grease to the Charleston Gas & Electric Co., Charleston, Ill. After testing same, E. C. Jenks, the manager, writes: "The samples shipped this company are all right, and we have ordered a supply from the Geo. Henseler Oil Co., St. Louis, Mo."

Mill Soaps.

The Warren Soap Manufacturing Company, on account of largely increased business, have thought best to increase their capital stock. Mr. Albert C. Warren, treasurer of the company for many years, and president since the death of Mr. George L. Stevens, finds his duties with the Warren Brothers Company, of which he is treasurer, taking up so much of his time that he feels it necessary to resign from the presidency of The Warren Soap Manufacturing Company. The new officers of this company are Henry W. Tenney, president; I. L. Welsh Reynolds, treasurer; and Stephen W. Libby, vice-president and superintendent.

Mr. Tenney has been with this company for twelve years, and is well known throughout New England, where he has looked after that section of their business. Mr. Reynolds came with the company at the same time as Mr. Tenney, and has taken care of their New York State business, where he has a very large trade. Mr. Libby, who has been chemist and superintendent of the works for the past fourteen years, will still have charge of that branch of the business. He is well known as one of the best soap chemists in the country. The company have ten salesmen on the road, and is one of the largest textile soap manufacturing concerns in the United States. Some of their employees, who have been with them for a long time, have been given the opportunity to acquire stock in the company.

The Eureka Fire Hose Co.

Warwick H. Payne, who has for a number of years been connected with the Eureka Fire Co., New York City, as manager of their southern department, with headquarters at Atlanta, Ga., has been placed in exclusive charge of the states of North and South Carolina and Virginia. The main office is at 704 Century Bldg., Atlanta, and Mr. Payne will be assisted there by Chas. B. Payne and H. H. Alvis. The latter will be located at some convenient point in Virginia, and give his undivided attention to that section. Warwick H. Payne and Chas. B. Payne will take charge of the southern portion of the territory.

The Eureka Fire Hose Co. ask that their many friends in the South communicate direct with the Atlantic headquarters for anything wanted in their line, and suggest that information as to contemplated purchases be wired at their expense.

A Bradford Pile Weaving Invention.

Professor Barker, in the course of a recent lecture at the Bradford Technical College, on "Pile Weaving on Ordinary Tappet, Dobby, and Jaquard Looms," described to a large company of manufacturers and others who were present, an invention of his own which had reference to the production of warp pile fabrics upon looms in ordinary use in the district. This is effected by means of a simple device costing about $5.00 per loom, which enables the pile warp to be crossed as in ordinary pile warp structures, while the loom is still allowed to run at its normal rate—namely, from 120 to 150 picks per minute, instead of 30 or 40 picks in the loom fitted with the wiring mechanism. Mr. Barker exhibited several classes of fabrics which have been woven on the college looms, these including the ordinary terry structure, special striped structures, and astrachan structures of a somewhat novel type. After the lecture the looms on which these fabrics are being woven were shown working to the audience.

A Wonderful Plant.

Anyone who approaches New York City from the Jersey side or from the river knows where the big plant of the Butterick Publishing Company is located, for in letters three stories high the word "Butterick" attracts attention, while by night these letters blazing forth in electric lights can be seen for miles in every direction, and constitute, we believe, the biggest electric light sign in existence, just as the Butterick Trio is the biggest aggregation of circulation.

Any doubter of the vast circulation of these publications must be converted after an inspection of the immense plant. This large building at the corner of Spring, Vandam and McDougal Sts., twenty stories high, is the very "last word" in the way of equipment in a publishing plant. The building was erected especially for the purpose, and it was thought that ample provision was made for the growth of their publications, but already every inch of room is occupied and the enormous facilities are in full use. The building is of fire proof construction throughout. The floors are a net work of steel beams and cement, and so thoroughly braced that when all the presses on the three immense floors which are occupied as press rooms are in full operation, there is not the slightest jar perceptible. This all tends to perfect press work. A printer inspecting the very high degree of mechanical perfection shown in the pages of the Delineator, Designer and New Idea Woman's Magazine, would hardly believe that these are printed on high speed cylinder presses, yet such is the case. Almost all magazines of this character are printed on flat presses at slow speed, in order to give time for the ink to dry without offset, but there is such a vast edition of these publications that there is no time for that, and, therefore, the highest skill in the press room is necessary to produce the results which the management demands.

Other floors are given over to the editorial department and the designing rooms. In these busy offices, scores of clever artists, designers and editors are preparing the matter, the pictures and fashion plates for the different magazines.

The business offices, where the circulation work and subscriptions are handled, is a scene of great activity, and filled with scores of busy clerks

The composing room, where the type is set by linotype machines, as well as by hand, gives employment to a hundred high grade compositors. In this department the advertisements which have been carefully designed in the advertising department are set up and all the job work for the establishment is done.

The advertising department occupies a beautiful suite of offices, presided over by its head genius, Thomas Balmer, the advertising director,

who is well known to the readers of this magazine through the most interesting series of articles on the subject of textile advertising which has been appearing for the past year. Mr. Balmer's private office is most luxuriously appointed and here are held frequent consultations with his outside staff and the different advertising agencies with whom he is in close touch. Here are planned the advertising campaigns which have been so successful in the past, and here many more equally successful ones will be conceived.

Advertising with Mr. Balmer is science and not chance. While the continuation of his articles in the Textile World Record was under discussion, the striking results of the new campaign recently inaugurated by the Arnold Print Works were spoken of. It would be amazing to most men, and probably greater even than the advertiser expected, but it was no surprise to Mr. Balmer, who knew what he could expect, and was not disappointed. The story of this advertiser's experience, as well as that of other successful campaigns, will appear in the Textile World Record, beginning with the story of the Buster Brown stocking in this issue.

Labor in Germany.

The German Government appears to be getting alarmed at the strike developments in various parts of the Empire. A great strike of miners in the Ruhr colliery district has attracted unsual attention, and is somewhat embarrassing to the sensibilities of the powers that be. Count Von Bulow, the Chancellor, compared last week in the Reichstag the methods of British trade unionists with those of their German colleagues, and said that what the British combinations had accomplished had been done wholly on economic grounds, without regard to party, and that what was needed in Germany was the emancipation of workmen organized in trade unions from the politics of a party which saw in the nursing of a strike only material for the incitement of hatred for the furtherance of its own interests. This may seem plausible to the uninitiated, but the Chancellor must remember that the comparison is not equitable. The workers in Germany are not allowed the same liberty in organizing as British workers. An unnatural yoke has driven them to the adoption of other methods, such as the political action referred to. The English trade unionists can never forget, especially those connected with the cotton trade, the humiliating conditions under which they held their International Textile Workers' Congress in Berlin five years ago. Government officials, booted and spurred, and with clanking swords, attended every sitting, took notes, and practically domineered the whole of the congress as their whims and moods prompted. They superseded the chairman, adjourned the congress if it became slightly turbulent, and officiated as watch-dogs for the German Emperor the whole of the week. Is it any wonder the trade unionists methods are different than ours under the circumstances? We appreciate the Chancellor's tribute to our way of doing business, but if it is so excellent, why not give the German workman the chance of doing likewise?—The Cotton Factory Times.

Recent Textile Patents.

BOBBIN HOLDER. 782,487. George A. Clark, Ambler, Pa., assignor to Draper Co., Hopedale, Mass.

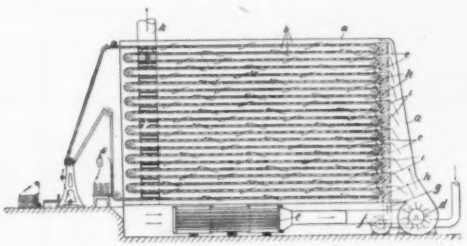
CARD PRODUCING and Reading-In Apparatus. Jacquard. 781,167. Carl Vorwerk, Barmen, Germany.

CARPET FABRIC, Woven. 783,328. Charles C. Stewart, Philadelphia, Pa., assignor of one-half to Archibald T. James, Philadelphia, Pa.

CLOTH STRIPS, Machine for Folding and Winding. 781,927. Abraham L. Adams, Bridgeport, Conn.

CLOTH, Treating. 782,845. David Gessner, Worcester, Mass.

DRYING APPARATUS, Woven Goods. 781,145. Moritz R. Jahr, Gera, Germany.



Hitherto methods and apparatus for drying woven goods generally had the disadvantage that the goods from beginning to end were subjected to the influence of dry heat uniformly high, whereby the "touch" and smoothness of the material was very much impaired, while at the same time this dry hot air had an injurious effect on dyed material. These disadvantages are avoided with the present invention, which consists of a method and apparatus for the drying of woven goods wherein the goods are led through passages, lying one above the other, through which the dry air passes in such a manner that at the entrance of the goods into the drying-machine they are at once subjected to the action of dry air of very high temperature, which is gradually reduced till in the last stage it is lowered to the ordinary temperature. This is affected by the hot air entering the channel at the bottom of the drying-machine, passing through movable flaps in certain volumes into the channels, where its temperature is regulated by means of fresh air and brought to the desired degree. The volume of fresh air which enters and regulates the heat is also adjusted by means of flaps or slides.

DYEING APPARATUS. 782,008. Leon Detre, Rheims, France.

DYEING MACHINE. 782,147. Julius Leisel, Charlotte, N. C.

FABRIC Steaming and Pressing Machine. 773,067. Elizabeth I. Fletcher, Norwich, Conn.

This invention is an apparatus or device for steaming and pressing fabrics, and is particularly adapted to the steaming and pressing of pile fabrics, such as velvet, plush, and the like. In renovating fabrics of this kind it is necessary to steam them and press them upon the under side, and the object of this invention is to accomplish this steaming and pressing operation without injuring the pile-surface and also to brush or clean the pile-surface at the same time the inner face or backing is being steamed or pressed.

FIBRES FOR SPINNING, Machinery for the Preparation of Vegetable. 781,280. John Good, Far Rockaway, New York.

HEMP BRAKE. 781,398. James Burnam, Peytontown, Ky.

LOOM WARP Stop Motion. 783,142. Andrew Schouler, New York, N. Y., assignor to Draper Co., Hopedale, Mass.

LOOM FILLING FORK Mechanism. 782,946. Arthur E. Benson, Magnolia, Miss., assignor to Draper Co., Hopedale, Mass.

LOOM FRINGE Pulling Mechanism. 782,061. Charles Rothwell, Philadelphia, Pa.

LOOM LET OFF Mechanism. 783,183. Clare H. Draper, Hopedale, Mass., assignor to Draper Co., Hopedale, Mass.

LOOM LET OFF Mechanism. 781,681. C. F. Roper, Hopedale, Mass., assignor to Draper Co., Hopedale, Mass.

LOOM NARROW WARE. 781,967. Eppa H. Ryon, Worcester, Mass., assignor to Crompton & Knowles Loom Works, Worcester, Mass.

LOOM PICK MOTION. 782,777. Henry Cote, West Warren, Mass., assignor to Draper Co., Hopedale, Mass.

LOOM PICKER. 781,350. Thomas G. Moser, Burlington, N. C., assignor of one-half to Robert F. Rice, Greensboro, N. C.

LOOM PICKER STICK Motion. 781,680. C. F. Roper, Hopedale, Mass., assignor to Draper Co., Hopedale, Mass.

LOOM PICKER STOP Motion. 783,110. August Dont, Manville, R. I.

LOOM PILE FABRIC. 782,494. Thomas B. Dornin and Nathaniel B. Shinn, Philadelphia, Pa.

LOOM PROTECTOR Mechanism. 782,949. Henry Cote, West Warren, Mass., assignor to Draper Co., Hopedale, Mass.

LOOM REED Detaching Device. 782,168. William McMichael, Woonsocket, R. I., and Malcolm Campbell, Boston, Mass., assignor to Woonsocket Machine and Press Co., Woonsocket, R. I.

LOOM SHEDDING Mechanism. 782,569. Fred Lacey, Valleyfield, Canada.

LOOM SHUTTLE. Automatic Filling Replenishing. 782,505. Oscar Janelle, Manchester, N. H., assignor to Harry E. Parker, Manchester, N. H.

LOOM SHUTTLE BOX Lock. 783,224. William H. Royal and James Prendergast, Frankford, Pa.

LOOM SHUTTLE BOX Operating Mechanism. 783,213. John T. Mears, Taunton, Mass., assignor to Mason Machine Works, Taunton, Mass.

LOOM SHUTTLE CHECK. Motion. 783,051. Charles F. Lafrance, Taunton, Mass.

LOOM SHUTTLE GUIDE, Narrow Ware. 781,256. Samuel Widmer and Adolph Widmer, Paterson, N. J.

LOOMS FOR WEAVING Tufted Fabrics, Spool Frame for. 783,277. James P. Humphries, Kidderminster, England.

PILE FABRIC. 782,745. Charles C. Gelder, Cynwyd, Pa.

PILE FABRIC, Woven. 782,178. Hovcep Sarafian, Yonkers, N. Y.

LOOM LET OFF and Take Up Mechanism. 779,397. William R. Burrows, Newark, N. J.

LOOM LUG STRAP HOLDER. 778,465. Melvin L. Stone, Lowell, Mass., assignor to Draper Co., Hopedale, Mass.

SPINDLE. 779,077. William Gihon, Chicopee, Mass.

It has been discovered that by making the shuttle binder in such a manner that a part of the operating-surface is capable of yielding and another part rigid, a device can be produced which is much lighter than the metal binders heretofore used and is also much more durable than the wooden ones. This result is accomplished by making the shuttle-binder a sort of skeleton frame consisting of two parts, one of which is straight and the other curved and longer than the other.

SPINDLE BEARING. 778,246. James J.Hughes and Henry E. Hughes, Central Falls, R. I.

SPINDLE DRIVING Bands. Mechanism for Guiding. 778,737. John Boyd, Bothwell, Scotland.

SHUTTLE THROWER. Pneumatic. 781,632. Ezekiel C. S. Cobb and Samuel T. MacMullen, Wilmington, Del.

SILK, COTTON, RAMIE, etc., Spreader for. 781,892. Christian Mann, Waldshut, Germany.

SPINNING FRAME Bobbin Holder. 782,535. Abraham Ashworth, Jamestown, N. Y.

SPINNING RING. 782,228. Theodore P. Farmer, Southwest Harbor, Me.

THREAD BOARD LIFTER, Automatic. 781,755. Jabez Wilkinson, Fall River, Mass.

THREAD DRESSING Machine. 782,192. George A. Fredenburgh, Pawtucket, R. I.

THREAD OR YARN TENSION Device. 781,861. Alonzo W. Allen, Philadelphia, Pa.

WEAVING MULTIPLE TUBULAR FABRICS and Hose Coverings. 781,349. George D. Moore, Worcester, Mass., assignor to the Multiple Woven Hose & Rubber Co., New York, N. Y.

C. E. RILEY & CO.

65 Franklin Street, .. BOSTON, MASS.

BUILDERS AND IMPORTERS OF

COTTON WOOLEN WORSTED

MACHINERY

DIRECT .. .. IMPORTERS OF **EGYPTIAN COTTON**

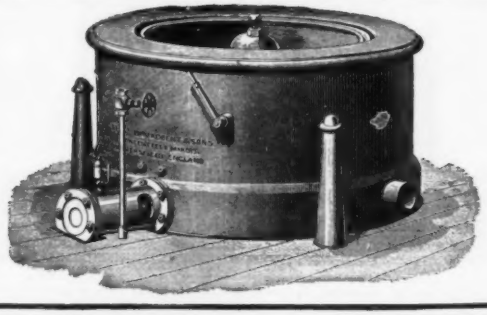
Thomas Broadbent & Sons,

Huddersfield, Eng.

PATENT DIRECT STEAM DRIVEN

HYDRO-EXTRACTORS

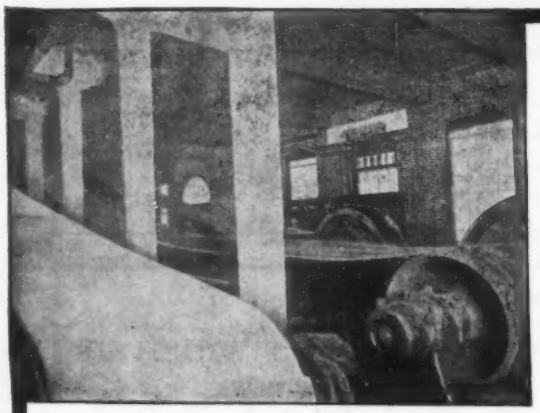
OVER 3500 IN USE. ALSO ELECTRICALLY DRIVEN



SUSPENDED ON LINKS. REQUIRING NO EXPENSIVE FOUNDATIONS

C. E. RILEY & CO., Sole Agents 65 Franklin St., Boston, Mass.

Machines Kept in Stock in Boston



JAMESTOWN, N. Y., Oct. 27, 1904.

CLING-SURFACE Co., Buffalo, N. Y.

GENTLEMEN:—The data herewith explains the conditions of the belts you have photographs of.

Our engine is 1000 H. P. The belts run from two 20 ft. pulleys (62 R. P. M.) to two 31" pulleys (450 R. P. M.) The large belt is 40" face, double leather, on 45 ft. centers. The shorter belt is 40" face, also double leather and on 35 ft. centers. The two belts were doing 500 H. P. when photographed and could do much more.

I have used Cling Surface here for five years and am entirely satisfied with it. These belts are clean, not sticky, pliable and in fine condition and the larger is running with a sag of 4 ft., while the smaller is 22" slack. I believe in slack belts and Cling-Surface permits me to run them so.

Yours very truly,

W. H. COBB, Chief Engr.,
Broadhead Worsted Mills.

Five Years Use in the Broadhead Mills

These big belts are a good example of what Cling-Surface is doing. Don't think of Cling-Surface merely as a material for belts. It is that, but its far reaching results make it a means to a new method of belt management—the easy or slack method, and that means low friction load, economy of oil, babbit, belts, fuel, power, time and trouble.

Get a package therefore and test it—severely.

CLING-SURFACE CO 199-205 Virginia St Buffalo N Y

BOSTON
170 Summer Street

NEW YORK
39 Cortlandt Street

PHILADELPHIA
The Bourse

LUNKENHEIMER

These are the original, reliable, quick-opening valves, constructed on practical principles.

The "Handy" for 75 lbs. working pressures is made in Brass, ½ to 4 inches; in Iron, brass mounted, 2 to 8 inches; All Iron, 1 to 8 inches.

The "Lever Throttle" for 175 lbs. working pressures is made in Brass, ¾ to 2½ inches; in Iron, brass mounted, 2½ to 6 inches. Either pattern made only in screw ends. Specify *Lunkenheimer* and order from your dealer. Write for catalog.

The Lunkenheimer Company,
Largest Manufacturers of
Engineering Specialties in the World.

CINCINNATI, O., U. S. A.

Branches:
New York: 26 Cortlandt St.
London: 35 Great Dover St.

"HANDY" GATE and "LEVER THROTTLE" VALVES

New York, 26 Cortlandt St. Philadelphia, 1428-32 Callowhill St. New Orleans, Tulane-Newcomb Bldg. London, 35 Great Dover St. Paris, 24 Boulevard Voltaire.

Buyers' Index.

The addresses of builders of mill machinery and dealers in mill supplies, whose names appear in the following classified index, may be found upon referring to their advertisement. The Alphabetical Index to advertisers follows this classified list. Buyers who are unable to find in these classified lists such machinery or supplies as they desire, are invited to communicate with the publishers, who can, in all probability, refer them to proper sources.

Advertisers whose names do not appear under desired headings will please notify the publishers. Such omissions are accidental, not intentional.

Accountants, Public.
Garry, Brown & Co.

Air Moistening System.
American Moistening Co.
Bell Pure Air & Cooling Co.
Schutte & Koerting Co.

Appraisals.
Audit & Appraisement Co. of America, The.

Architects and Mill Engineers.
Ballinger & Perrott.
Dean & Main.
Ferguson, John W.
Suck, Adolph.

Auditors.
Garry, Brown & Co.

Automatic Feeds for Cotton and Wool.
American Drying Machinery Co.
Harwood, Geo. S. & Son.
Kitson Machine Co.
Leigh, Evan A.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Schofield, Wm. Co.
Woonsocket Machine & Press Co.

Balling Machine.
North Chelmsford Machine Co.
Torrance Mfg. Co.

Bandings.
——See under Yarns.

Baskets.
Burlington Basket Co.
Lane, W. T. & Bro.
Morris & Co.

Belting.
Houghton, E. F., Co.
Jeffrey Manufacturing Co.
Main Belting Co.
Shultz Belting Co.
——See also Mill Supplies.

Belt Dressing.
Cling Surface Mfg. Co.
Dixon, Jas., Crucible Co.
Houghton, E. F., Co.
Stephenson Mfg. Co.

Belt Lacing Machines.
Diamond Drill & Machinery Co.

Bindings.
——See Tapes and Braids.

Bleaching Kiers.
Allen, William Sons Co.
Arlington Mch. Wks. (Arthur Birch, prop.)
Textile Finishing Machinery Co.

Bleaching Materials.
Bosson & Lane.
Roessler & Hasslacher Chemical Co.

Blowers and Blower Systems.
American Blower Co.
Barney Ventilating Fan Works.
Boston Blower Co.
Buffalo Forge Co.
Green Fuel Economizer Co.
Mass. Fan Co.
New York Blower Co.
Philadelphia Drying Machinery Co.
Schutte & Koerting Co.
Sturtevant, B. F., Co.
Schnitzler, Chas. H.

Bobbin Covers.
Kolb, Frank H.

Bobbins, Spools, Shuttles, Etc.
Leigh, Evan A.
Tebbets, E. L. & Co.

Boilers.
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Boiler Arches, "Steel Mixture."
McLeod & Henry.

Boiler Setting.
McLeod & Henry.

Boxes, Cloth Boards, Etc.
Pearson, J. T.

Boxes (Paper).
——See Paper Boxes.

Braiding Machinery.
New England Butt Co.
Textile Machine Works.

Braids.
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Brass (Perforated).
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Brushes.
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Mason Brush Works.

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Burr Pickers.
Curtis & Marble Machine Co.
Sargent's, C. G., Sons.

Burlaps.
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Buttons.
International Button Co.

Calico Printers' Machinery and Supplies.
Arlington Mch. Wks. (Arthur Birch, prop.)
Butterworth, H. W. & Sons Co.
Taunton, New Bedford, Copper Co.
Textile Finishing Mchry. Co.
——See also Dyeing, Bleaching, Machinery, etc.

Canvas Baskets.
Burlington Basket Co.
Lane, W. T. & Bro.
Morris & Co.

Carbonizing.
Riverdale Woolen Co.

Carbonizing Machinery.
American Drying Machinery Co.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Sargent's, C. G., Sons.

Card Clothing.
Ashworth, Elijah.
Bowes, L. M., Co.
Leigh, Evan A.
Riley, C. E. & Co.
Stoddard, Haserick, Richards & Co.

Card Feeds.
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Card Grinding Machinery.
Entwistle, T. C., Co.
Leigh, Evan A.
Philadelphia Textile Machinery Co.
Riley, C. E. & Co.
Roy, B. S. & Son.
Stoddard, Haserick, Richards & Co.

Carders' Tools.
Brown, W. H.

Carpet Machinery.
Altemus, Jacob K.
Curtis & Marble Machine Co.
Philadelphia Textile Machinery Co

Castings.
Link Belt Engineering Co.
Lunkenheimer Co.
Schofield, Wm., Co.
Yale & Towne Mfg. Co.

Chain Blocks and Hoist.

Chemicals.
Grasselli Chemical Co.
Klabfleisch, Franklin H. & Co.
Roessler & Hasslacher Chemical Co
Solvay Process Co.

Chemists.
Little & Walker.

Cling Surface.
Cling Surface Mfg. Co.

Clocks.
Pettes & Randall Co.
Riggs & Brothers.

Cloth Boards.
Chaffee Bros.
Pearson, J. T.
Shryock, J. K.
Smyth, J. L. N. Paper Co.

Cloth Stretchers.
Arlington Mch. Wks. (Arthur Birch, prop.)
Leyland, Thomas & Co.
Textile Finishing Machinery Co.

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Jeffrey Manufacturing Co.
Link Belt Engineering Co.

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Copper Print Rollers.
Rome Metal Co.
Taunton, New Bedford Copper Co.

Coppersmiths.
Badger, E. B. & Sons Co.

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Butterworth, H. W. & Sons Co.
Textile Finishing Machinery Co.

Cotton.
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Charles, W. B.
Riley, C. E. & Co.
Stoddard, Haserick, Richards Co.

Cotton Elevators.
Buffalo Forge Co.

Cotton Machinery.
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American Drying Machinery Co.
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Baker Machine Co.
Barker, James.
Butterworth, H. W. & Sons Co.
Crompton & Knowles Loom Works.
Crompton-Thayer Loom Co.
Cohoes Foundry & Machine Co.
Coldwell-Gildard Co.
Curtis & Marble Machine Co.
Draper Company.
Easton-Burnham Co.
Elliott & Hall.
Entwistle, T. C., Co.
Firth, William, Co.
Houghton, L. T.
Howard & Bullough American Mach. Co.
Kilburn, Lincoln & Co.
Kitson Machine Co.
Leigh, Evan A.
Lowell Machine Shop.
Mason Machine Works.
Metallic Drawing Roll Co., The.
Neverslip Cop Spindle Co.
North Chelmsford Machine Co.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Providence Machine Co.
Riley, C. E. & Co.

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Textile Finishing Machinery Co.
Vacuum Dyeing Machine Co.
Whitin Machine Works.
Woonsocket Machine & Press Co.

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Warren Soap Mfg. Co.

Cotton Waste.
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Dixon, Jos., Crucible Co.
Lowell Crayon Co.

Cutter for Knit Goods.
Eastman Machine Co.
Langston, Samuel M.

Cutting Machinery.
Eastman Machine Co.

Dating and Time Stamps.
Riggs & Brothers.

Dextrine.
Stein, Hirsh & Co.

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Crompton & Knowles Loom Works.
Crompton-Thayer Loom Co.

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Metallic Drawing Roll Co., The.

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Dust Collectors.
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Dyers, Bleachers and Finishers.
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Cranston Worsted Mills (yarns).
Davidson, J. F.
Firth & Foster Co.
Greenwood, R. & Bault.
Home Bleach & Dye Works.
Ingrahamville Dye Works.
Lorimer's, The Wm. H. & Sons Co.
Maryland Bleach & Dye Works.
Molt Bros. (Indigo Blue).
Pawtucket Dyeing & Bleaching Co.
Providence Mills Mfg. Co.
Rowland, Samuel.

Dyeing, Drying, Bleaching and Finishing Machinery.
Allen, William Sons Co.
American Blower Co.
American Drying Machinery Co.
Arlington Mch. Wks. (Arthur Birch, prop.)
Birch, Arthur, Arlington Machine Works.
Buffalo Forge Co.
Butterworth, H. W. & Sons Co.
Curtis & Marble Machine Co.
Entwistle, T. C., Co.
Fabric Measuring & Packaging Co.
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Smith, Drum & Co.
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Vacuum Dyeing Machine Co.
Vacuum Process Co.
Whiteley, William, & Sons, Ltd.
Whittle, Jas. H.

Dye House Cans.
Hill, James, Mfg. Co.

Dye Sticks.
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Atteaux, F. E. & Co.
Berlin Aniline Works.
Bischoff & Co.
Bosson & Lane.
Cassella Color Co.
Grasselli Chemical Co.
Kalle & Co.
Farbenfabriken of Elberfeld Co.
Ford, J. B., Co.
Geigy Aniline & Extract Co.
Geisenheimer & Co.
Johnson, Chas. A. & Co.
Klabfleisch, Franklin H. & Co.
Klipstein, A. & Co.
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Leyland, Thos. & Co.
Metz, H. A. & Co.
Molt Bros. (Indigo Blue).
Nicol, J. M. & J. E.
Roessler & Hasslacher Chemical Co.
Solvay Process Co.
Sykes, Walter F. & Co.
Thayer, Ed. M.
Vila, H. S.

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——See Tapes, Braids and Edgings.

Electrical Construction.
Allis Chalmers Company.
General Electric Co.
Mechanical Appliance Co.
National Electric Co.
Sturtevant, B. F., Company.
Westinghouse Electric & Mfg. Co.

Electric Cloth Cutter.
Eastman Machine Co.

Electric Fans.
American Blower Co.
Buffalo Forge Co.
General Electric Co.
Mass. Fan Co.
Mechanical Appliance Co.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Sturtevant, B. F., Co.
Westinghouse Electric & Mfg. Co.

Electric Lamps.
Sturtevant, B. F., Company.

Electric Lighting.
Allis Chalmers Company.
General Electric Co.
Sturtevant, B. F., Company.
Westinghouse Electric & Mfg. Co.

Electric Motors.
Allis Chalmers Company.
General Electric Co.
Mechanical Appliance Co.
National Electric Co.
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Westinghouse Electric & Mfg. Co.

Elevators.
Cohoes Foundry & Machine Co.
Jeffrey Manufacturing Co.
Salem Elevator Works.

Employees' Time Recorders.
Pettes & Randall Co.
Riggs & Brothers.

Engravers.
Smith Bros.

Exhaust Heads.
Sturtevant, B. F., Co.

Expert Accountants.
Garry, Brown & Co.

Fans—Exhaust and Ventilating.
——See Ventilating Apparatus

Fans.
Green Fuel Economizer Co.

Feed Water Heaters.
Green Fuel Economizer Co
Murray Iron Works Co.
Scaife, W. B. & Sons.

Feed Water Pumps.
Goulds Mfg. Co.
Murray Iron Works Co.
Scaife, W. B. & Sons.

Feed Water Purifiers.
Philadelphia Water Purification Co.

Feeds.
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Filters.
Norwood Engineering Co.
Phila. Water Purification Co., The.
Scaife, W. B. & Sons.

Finishing Machinery.
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Fire Box Blocks, "Steel Mixture."
McLeod & Henry Co.

Fire Brick.
Borgner, Cyrus, Co.
McLeod & Henry.

Fire Extinguishers.
Badger, E. B. & Sons Co.

Fire Hose.
Eureka Fire Hose Co.

Fire Hydrants.
Norwood Engineering Co.

Fire Proof Doors and Windows.
Badger, E. B., & Sons Co.
Lupton's, David, Sons Co.

Flax, Tow, Hemp and Jute Machinery.
Fairbairn-Lawson-Combes-Barlour, Ltd.
Leigh, Evan A.

Fluted Rolls.
Hood, R. H.
Leigh, Evan A.
Riley, C. E. & Co.
Thurston, A. G. & Son.

Flyers.
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Buffalo Forge Co.
Sturtevant, B. F., Co.

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Hunter, Jas., Machine Co.
Kenyon, D. R. & Son.

Garnetts.
Leigh, Evan A.
Philadelphia Textile Machinery Co.

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Jones, Lewis.

Gas Exhausters.
Sturtevant, B. F., Co.

Gauges.
Crosby Steam Gage & Valve Co.
Lunkenheimer Co.
Walworth Manufacturing Co

Gears.
New Process Raw Hide Co.

Gear Cutting Machine.
Whiton, The D. E., Co.

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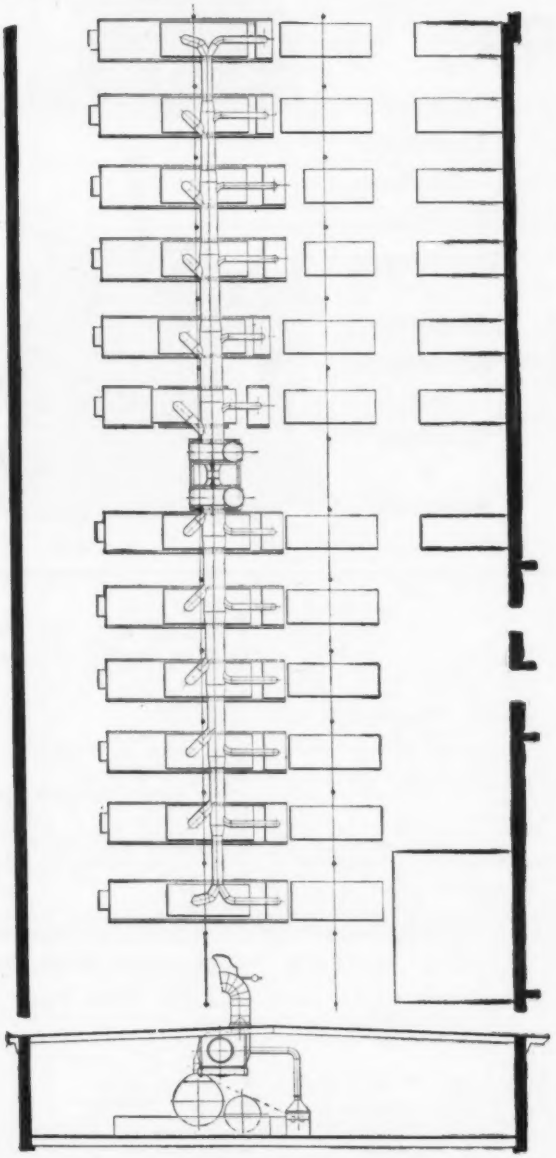
We go to the heart of the matter



in ventilating slasher rooms by closely hooding the source of the trouble—the size box and the large cylinder — and drawing the steam away by means of a fan. The yarn dries quicker and the output is increased.

In an old plant with wooden hoods, we disconnect the ventilators through the roof and substitute a fan with galvanized iron pipe, or better yet, remove the wood construction altogether, and install an up-to-date arrangement of small galvanized iron hoods.

We manufacture blowers, engines, motors, generators, economizers, forges, mechanical draft apparatus, exhaust heads, steam heating, ventilating and drying apparatus, etc.

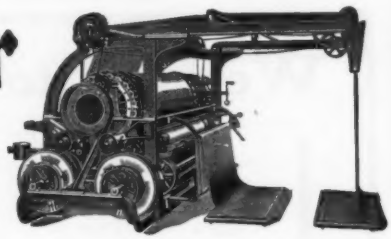
B. F. STURTEVANT CO., Boston, Mass.

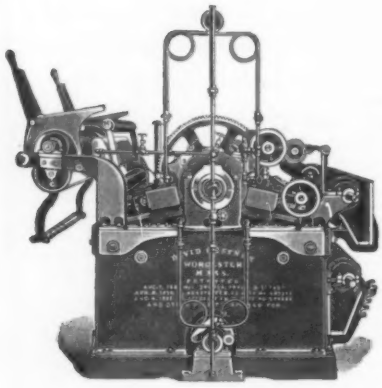
General Office and Works, Hyde Park, Mass.

New York Philadelphia Chicago London 417

David Gessner

Worcester, Mass.

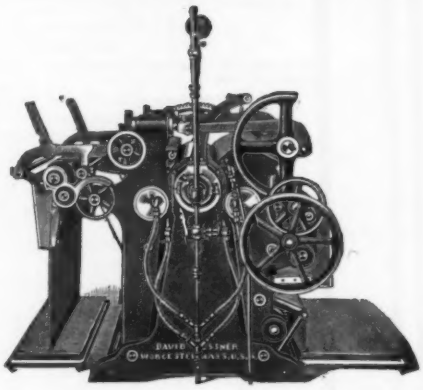




Latest Improved Cloth Finishing Machinery

—

Napping Machines and Presses a Specialty



Generating Sets.
Buffalo Forge Co.
Sturtevant, B. F., Co.

Grate Bars.
Tupper, W. W & Co.

Grease.
Cook's, Adam, Son.

Grids for Cotton Openers.
Schaellibaum, Robert, Company.

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Heddles.
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Stoddard, Haserick, Richards & Co.

Hoisting Apparatus.
Yale & Towne Mfg. Co.

Hosiery Boards.
J. T. Pearson,

Hosiery Labels.
Beck, Charles Paper Co.
Kaumagraph Company.

Humidifying Apparatus.
American Air Moistening Co.
Bell Pure Air & Cooling Co.
Shutte & Koerting Co.

Hydro Extractors.
American Tool & Machine Co.
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Stoddard, Haserick, Richards & Co.
Textile Finishing Machinery Co.
Whiteley, William, & Sons, Ltd.
Whittle, Jas. H.

Injectors.
Lunkenheimer Co.

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Iron Work.
Link Belt Engineering Co.

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Halton's, Thomas, Sons.

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Charles, W. B.
Cheney Bros.
Friedberger Mfg. Co.
Hepner & Horwitz.
International Button Co.
Kreut & Fite Mfg. Co.
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Scott & Williams.
Union Special Machine Co.
Willcox & Gibbs Sewing Machine Co.

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Paxton & O'Neill.
Stafford & Holt.

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Nye & Tredick Co.
Paxton & O'Neill.
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THE NEW
CROMPTON-THAYER LOOM COMPANY
MANUFACTURERS OF
FANCY LOOMS
For Weaving Worsted and Woolen, Fancy Cottons and Silk Fabrics.
DOBBIES, BOX MOTIONS AND SUPPLIES.
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Alexander & Garsed, Southern Agents.

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Hepworth, John W. & Co.
Leighton Machine Co.

Lubricators.
Cook's, Adam, Son.
Borne, Scrymser Co.
Dixon, Jos., Crucible Co.
Lunkenheimer Co.

Lumpers.
Gerry, George & Son.
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Whiton, The D. E. Co.

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Walder, J.

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Elliott & Hall.
Fabric Measuring & Packaging Co.

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Boston Blower Co.
Buffalo Forge Co.
Green Fuel Economizer Co.
Massachusetts Fan Co.
Sturtevant, B. F., Co.

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Home Bleach & Dye Works.
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Smith, Drum & Co.
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Whiteley, William, & Sons, Ltd.

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Lupton's, David, Sons Co.

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Eureka Fire Hose Co.
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Morris & Co.
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Stephenson Mfg. Co.
Stoddard, Haserick, Richards & Co.
Thurston, A. G., & Son.
Tucker, W. W. & C. F.
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Ward & Vandegrift.
Walworth Manufacturing Co.

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Jones, Lewis.
Leigh, Evan A.
Parks & Woolsen Machinery Co.
Whiteley, William, & Sons, Ltd.

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Malcolm Mills Co.
Ryle, Wm., & Co.

Oil Cups.
Lunkenheimer Co.
Tucker, W. & C. F.
Walworth Manufacturing Co

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Murphy, E. W., & Co.
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Stephenson Mfg. Co.

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Overhead Tracks.
Cohoes Foundry & Machine Co.

Overseaming Machines.
American Overedging & Seaming Machine Co.
Merrow Machine Co.
Willcox & Gibbs Sewing Machine Co.

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Shultz "SABLE" Rawhide Belting

the surfaces only are tanned. Tanned by a secret process that makes them feel like kid to the touch and gives a guaranteed pulling power of 33 per cent. more than the best oak tanned belting made. Our "Sable" belt will transmit more power and reduce your future belt bills. Let us send one on 60 days' trial. Illustrated Booklet No. 6 clinches the argument. Write.

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for

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Milwaukee

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Chicago, Old Colony Building.
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New Orleans, La., Hibernia Bank Bldg.

SALES OFFICES:
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Detroit, Miller, Seldon Elect. Co.
St. Louis, 220 Chemical Building.
Denver, Hendrie & Bolthoff Mfg. & S. Co
Seattle & San Francisco } Kilbourne & Clark Co.

Motors.
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Pantagraphs for Mill Engraving.
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Smyth, J. L. N. Paper Co.

Paper Box Machinery.
Beck, Chas., Paper Co., Ltd.
Langston, Samuel M.

Patent Solicitors.
Crosby & Gregory.
Howson & Howson.

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Peroxide of Sodium.
Roessler & Hasslacher Chemical Co.

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Riley, C. E., & Co.
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Walworth Mfg. Co.

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Walworth Mfg. Co

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Ribbons.
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Cheney Bros.

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Wickes Bros.

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Lunkenheimer Co.
Mason Regulator Co.
Schutte & Koerting Co.
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Allington & Curtis Mfg. Co.
American Air Moistening Co.
American Blower Co.
American Drying Machinery Co.
Barney Ventilating Fan Works.
Bell Pure Air & Cooling Co.
Berry, A. Hun.
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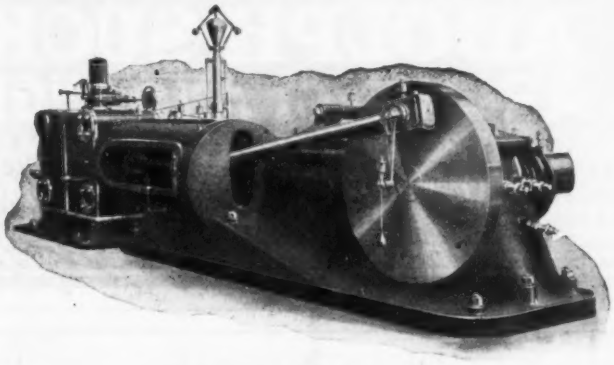

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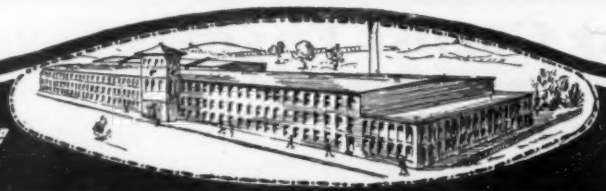

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A FAN WHEEL
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FOR SALE.
Commercial Dye House

near large Western City. Extensively known, in operation twelve years. Trade covers all the West and South, and East to Buffalo and Pittsburgh. Fitted to dye and finish wool piece goods and to dye and spool cotton yarns. Now running at a profit. Sale covers machinery, lease of building and good will. Price $10,000. For particulars address C. H. HALL, 4751 Calumet Ave., Chicago, Ill.

WOOLEN MILL FOR SALE

Fully equipped for making Blankets. Also machinery for making Cassimeres, &c. Land, substantial Brick Buildings and Machinery. Address **BLANKET MILL**, Textile World Record, Boston, Mass.

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I will sell or place on royalty a patent stitch for ribbed knit underwear. A very novel effect can be produced on any rib frames without additional parts. Can also be changed from one stitch to another, as in shaped goods. four different designs can be made in a single length garment. Any style of knitting can be made, such as 1 x 1 plain or tuck, 2 x 2 Swiss rib, etc., both in summer and winter weights. Address "J. C. D.," Textile World Record, Boston, Mass.

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Yarn Mill in Operation and Good Condition for Sale or Lease.

Parties desiring to retire from active management because of other business engagements, will give practical management to active, experienced business man; he taking some financial interest in the business; or will sell or lease on favorable terms, yarn mill, in full operation, in good condition, seven sets Davis & Furber cards, seven mules, making cotton waste yarns on wool principle, product sold ahead. Mill contains space and power for additional carding, spinning, weaving or knitting machinery.

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2 Hopedale Warpers, V Creels.
1 Cole Bros. Long Chainer.
1 Cole Bros. Long Chain Beamer.
1 Anderston Slasher, 50″ wide with feed table for six beams.

Address COPE & CO., Wayne Junction, Germantown, Pa.

FACTORY ACCOMMODATION FOR RENT.

American Manufacturers desiring to open manufacturing branches in Canada can secure accommodation from the undersigned. Steam heat, electric light and power, natural gas, railway switches at door. Abundant labor. Write for particulars. State what you want. THE MILL PROPERTIES COMPANY, Limited, Dundas, Canada.

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LINDSAY & HYDE WINDER.

12 or 24 spindles, differential motion; in perfect working order; fair price. CRESCENT COMPANY, 569 Broadway, New York.

NOTICE—CAPITALISTS

A reliable party, living in a small, well located, Southern city, with rich resources, is desirous of negotiating with capitalists who are seriously considering the location of cotton mills or other substantial manufacturing plants in the South. An attractive proposition will be submitted that will afford enormous profits. Address "PROMOTOR," care Textile World Record, Boston, Mass.

Any Man Looking for a Good Business Should Read This.

The owner of a large knitting mill property, manufacturing wool, merino and cotton hosiery, will retire from business for personal reasons.

The plant is located at a splendid shipping point in the Middle West, with advantages of cheap wool, raw material and fuel.

The business will be sold as a going concern, including the plant, stock on hand, unfilled orders showing profit, together with established profitable business requiring years to build up.

Very reasonable figures and terms will be made to responsible purchaser.

The plant is in splendid physical condition, modern, and recently newly equipped with up-to-date chinery. The business has a record of profit and will bear close nvestigation. The mill is in full opera tion, and has a good staff of practical men who can be retained if desired. This is an exceptional chance to step into a profitably established business. Full information on application to principals only.

Address, "Retiring," Textile World Record, Boston, Mass.

TO MANUFACTURERS AND MEN WITH CAPITAL.

I have invented a good, practical, staple line of Knitted Wear, made on a narrow flat knitting machine.

The line is an exceptionally good one, as the goods can be worn by both men and women.

A great success is assured for any one who may purchase this invention. It produces goods similar to high priced imported machines.

Address, "Invention," Textile World Record, Boston, Mass.

Woolen Machinery Wanted. Parties owning 3 or 4 set up to date Woolen Machinery can learn of something to their advantage by addressing P. O. Box 606, Oregon City, Ore.

Share for Sale. On account of failing health I wish to sell my share in a Knitting Factory, located in a Northern State. Nice new plant equipped with all necessary machinery for making sweaters, cardigans and hosiery. Mill is running with a good demand of product at a satisfactory profit. Good opportunity for a practical knitter who can take the position of superintendent at a good salary. A. D., care of Textile World Record.

Wanted. Bright energetic man to rent and put in operation a small hosiery plant consisting of six knitters. Must be a practical man. Address Leipsic Hosiery Co., Leipsic, Ohio.

A Practical Dyer and Bleacher

of ten years' experience as Overseer and Superintendent, wants to enlist Capital to start a Bleaching and Dyeing establishment. Would prefer someone who has a plant suitable for the purpose. An excellent opportunity for the right party. Address Dyer and Bleacher, Textile World Record, Boston, Mass.

Wanted. Second-hand screw-press for pressing 6/4 width woolen piece-goods. D 108, Bourse Bldg., Phila., Pa.

Agency. A well known large manufacturing establishment for knitting machines, well introduced in the United States, desires an active agent on his own account. Must be familiar with the business. Persons corresponding in German are preferred. Address with references, R 3602 care of Haasenstein & Volger, A. G. Leipzig.

Machinery Bargains.

Attention is called to the special list of machinery offered for sale on page 53. Some rare bargains in Worsted Machinery are offered and the lots are as yet unbroken. Send for complete list.

Speed & Stephenson, 170 Summer St., Boston, Mass.

SITUATIONS WANTED.

Boss Dyer (Saxon), with twelve years' experience in Germany and ten years in the United States in the art of bleaching and dyeing of fast black and colors on hosiery, all kinds of knit goods (garment or piece) and skein yarns, desires to change present position. Gilt-edge references. "Ungreenable" Textile World Record.

Knitting Mill Superintendent. Open for position, having devoted twenty-five years to the business, starting at the beginning, and worked up. Thoroughly understands purchasing stock for yarn, etc. Can furnish the best of references. Address, "Superintendent," care of Textile World Record, Boston, Mass.

Foreman Latch Needle Knitter. Twelve years' experience on men's, women's and children's underwear, plaited, straight and shaped work. Worked on S. & W., N. & T., Champion, S. & H., and McM. & W. machines. 32 years old; American; married. Best of references. Address Foreman, 443 N. Fifth St., Hamilton Ohio.

MILL MANAGER.

Advertiser with thorough practical knowledge of the manufacture of the finest West of England cloths, dress and covert coatings, fancy worsted suitings, plain and twill black vicunas, well up to date, is open for a position in an American Woolen Mill as manager, part or sole responsibility, 15 years' experience. Age 32. Good salary essential. Address letters to "Textile," care of Coes Advertising Agency, 20 and 21 High Holborn, London, Eng.

Curtain Dresser and Starcher. Nottingham man seeks position. Used to rollers and frames. Many years experience as foreman. Lace, care of Textile World Record, Boston, Mass.

Latch Needle Boss Knitter

Wants Position. Ten years experience. Any class ribbed goods. Any make of machines. Two years on sewing machines. References. Address "Latch Needle," Textile World Record, Boston, Mass.

SITUATIONS WANTED.

Thefollowing advertisements are a portion of those of superintendents and overseers of whom full particulars are on file at this office. Manufacturers who may be in need of such men may address them in care of Textile World Record, or state their requirements directly, and the addresses of suitable men will be furnished without charge.

Any paid-in-advance subscriber may have his name placed on the list of those desiring positions, upon filling out the requisite blanks, furnished upon request. Correspondence is confidential.

COTTON SUPERINTENDENTS.

Superintendent or assistant of silk or cotton mill. Worked on plain and fancy ribbons and all classes of goods in broad silks, dress silks and tie silks, also Jacquard work. References. 3185, Textile World Record.

Superintendent or assistant superintendent cotton mill. Age 30; American, single. All kinds of cotton goods. Can take place at once. 3199 Textile World Record.

Superintendent of broad silk mill wants position. Age 39; English; married. Worked on mostly plain goods. Could be of good service to some reliable concern just starting up. Has small plant of his own which he would put in as stock with a first-class concern. 3154, Textile World Record.

Superintendent. Would like position in South. Not particular about salary to start. Machinist and thoroughly acquainted with all kinds of card room machinery, also spinning frames. Taken superintendent course in textile school and has had 23 years of practical experience in the mill, mostly on fine yarn work. 3044, Textile World Record.

Cotton Mill Superintendent. Age 38; Scotch; married. All counts of American and Egyptian cotton from 10 to 60, twist and weft, warps, beams, and bundles and crape yarns, super quality. Familiar with Platt, Asa Lee, Howard & Bullough, Hetherington and Brooks & Doxey machinery. First-class references. 3042, Textile World Record.

Overseer of Cotton Carding. Age 32; married. Carded and combed yarn, fine and coarse, lenos, lawns, shirtings. English and American makes of machinery. References. 3025, Textile World Record.

Cotton Mill Superintendent, or assistant. Age 34; married. Worked on cotton machinery on coarse and medium numbers. Textile school education in designing, carding and spinning. 3003, Textile World Record.

Assistant Superintendent or boss weaver of cotton mill. Twenty-five years' experience. Unquestionable references as to character and ability. Thoroughly acquainted with plain, fancy box or lappet looms. Can take place on short notice. 3084, Textile World Record.

Superintendent of Cotton Yarn Mill or duck mill. A young man; American; married. Prefers position in the South. Worked in different departments, spinning, spooling, twisting, warping, reeling and balling and now ready for a superintendent's place. Unquestionable references. 3087, Textile World Record.

Superintendent. All kinds of fancy cotton, white and colored, plain and fancy, jacquard and box work, also silks and worsteds. Would take good overseer of weaving position. 3120, Textile World Record.

Superintendent, or overseer of carding. Worked on combed and carded yarn from 20 up to 140, twilled sateens, lawns, sheetings and shirtings. English and American machinery. 3036, Textile World Record.

Asst. Superintendent or Overseer. 20 years' experience as overseer in both England and Scotland over combing, drawing, spinning, etc. Can work both long and short wools, get up all kinds of mixtures, instruct the shading of batches, etc. Has good references. 43 years of age. 3086, Textile World Record.

WOOLEN SUPERINTENDENTS.

General Manager, agent, superintendent or designer. Worked on everything from fine worsted to a blanket. Good experience. Aged 37; American; married. 3172, Textile World Record.

Superintendent or Designer. Age 37; American; married. All grades of woolens and also cotton warp goods. Will not go South or to Canada. 3124, Textile World Record.

Asst. Agent, superintendent or mechanical engineer in woolen or carpet mill of any kind. Age 30; married. Excellent references. 3178, Textile World Record.

Manager, superintendent or designer. Age 30; English; married. Experienced in England and in this country. Mohairs, all classes of worsted suitings, plain and fancy dress goods. 3184, Textile World Record.

Superintendent or assistant superintendent wants position. Age 31; American; married. Good experience on all kinds of goods, especially on union and satinets. Good references. Six years' experience in present place, five as overseer and one as superintendent. 3139, Textile World Record.

Superintendent or Designer. Age 37. English. Married. Experienced in this country and England. Worked on cloakings, suitings, coverts, broadcloths, etc. Mill closed, and wants place at once. Good references. 3140, Textile World Record.

Superintendent, manager or designer. Age 37; English; married. Worsted and woolen goods for men's wear and rain cloths. Worked in English mills, and has also been employed in this country. 3103, Textile World Record.

Superintendent, age 34; American; married. Worked on fancy woolens. Not employed, and can take position at once. Will not go to Canada or West or South. Would take a good boss spinner place or assistant superintendent, but wants over $4.00 per day. 3104, Textile World Record.

Superintendent or designer of small or medium sized mill. All kinds of fancy worsteds, cassimeres, cheviots, overcoatings and dress goods. Age 31; married; Scotch. 3076, Textile World Record.

Superintendent or boss weaver. 15 years' experience in worsted, woolen and silk goods. Graduate of Philadelphia Textile School. 32 years old; married. Good manager of help. American. 3119, Textile World Record.

Superintendent and designer, or assistant superintendent. Age 34; married. Worked on cloths ranging from all cotton to all wool and worsteds, such as cotton worsteds, jeans, army cloths, kerseys, etc. Excellent references. 3148, Textile World Record.

Superintendent and Designer. Age 30; American; married. Cotton warp, worsted and silk vestings, tapestry curtains, plaid backs, broadcloth, etc. 3146, Textile World Record.

Superintendent. Worked on cassimeres, unions, satinets, overcoatings, horse goods, bed blankets, linings, etc. Understands stock mixing, picking and figuring. Has had full charge of mill. 3074, Textile World Record.

Superintendent. Has made yarn and shoddies and about everything in woolen line. Good general knowledge of woolen manufacture. Familiar with English, Belgium and American carding, spinning and preparatory machinery. 3088, Textile World Record.

COTTON CARDERS.

Carder in Cotton Mill. Coarse or fine, white or colored, hosiery, Egyptian, etc. Age 35; Canadian; married 3029, Textile World Record.

Overseer of Carding. Large experience on all kinds of work and both English and American systems. Can furnish first-class references. Had charge of carding in some of the best New England mills. 3009, Textile World Record.

Overseer of Carding or cotton ring spinning. Worked on carded and combed Peelers, Egyptian, and Sea Island cottons, making yarns from 8 to 80. 3015, Textile World Record.

Overseer of Carding. Has held all positions in picker and card rooms. White and colored goods, 8s to 40s. 3070, Textile World Record.

Overseer of Carding Mill. All kinds of fine yarns. Started up two of the largest card rooms in New England. Considered an expert in the manufacture of combed yarns from the bale to the finished article. First-class recommendations. 1745, Textile World Rcord.

Overseer of Cotton Carding. Worked on all classes of cotton, carded and combed, in counts to 135s. Will not go West or South. 3061, Textile World Record.

Overseer of Carding Department. Age 38; English; married. Plain and fancy goods; both combed and carded, Cotton Sea Island, Peruvian, Egyptian, Peeler, etc. Good references. 3196, Textile World Record.

Overseer of Carding or Superintendent. Wide experience in large mills. Age 42; married. Finest of references. Will take large carding or superintendency. Familiar with all counts. 3133, Textile World Record.

Overseer or secondhand in preparatory department of long chain beaming, quilling, tape dressing, warping and spooling. A Scotchman; married. Will not go West or South. 3156, Textile World Record.

WOOLEN CARDERS.

Wanted. Position as boss carder by a thoroughly competent man who has had fifteen years' experience on flannels, cassimeres, knit goods, wool, cotton and shoddy, cotton waste on woolen cards. Has good references as to character and ability. Address, "Boss Carder," Textile World Record, Boston, Mass.

Overseer of Woolen Carding. Worked on all wool, wool and shoddy, wool, shoddy and noils. Wants $4 a day. Familiar with Davis & Furber, Furbush, Lombard and Bollette and Brown Patent. 3071, Textile World Record.

Overseer of Combing, washing, carding. Age 36, English, married. All classes of wool. Good experience and first-class recommendation. 3094, Textile World Record.

Overseer of Woolen Carding. Would accept secondhand position. All wool, cotton and wool, shoddies, mixes, worsteds. Does not wish for position on shoddy, but would consider one. Blankets, suitings, flannels. Understands spinning. 3093, Textile World Record.

Carder and Spinner. Been overseer 32 years, making every variety of cassimere, flannels, overcoatings, cloakings, dress goods, etc. Married; American. 3132, Textile World Record.

Overseer of Carding. Age 30; American married; Nearly all classes of goods. Good experience and references. Address 3170, Textile World Record, Boston.

Secondhand in wool card room. Age 23; American. Wool and cotton mixes. References. 3198, Textile World Record.

COTTON SPINNERS.

Overseer of Ring Spinning, spooling, long chain beaming, slashing and drawing-in. All kinds of fancies, sheetings, etc. $3.00 per day up. 3202 Textile World Record.

Overseer Ring Spinning, or asst. superintendent. Sea Island combed from 6s to 30s, American from 6s to 50s; in fact, all grades of cotton, also expert on cable yarn. Prefers South, but will go anywhere. Wants $3.50 per day to begin with. 3020, Textile World Record.

Overseer of Ring Spinning. Aged 42; American; married. Ginghams, sheetings, awnings, denims, etc.; $3 to $4 per day. 3018, Textile World Record.

Overseer of Cotton Mule Spinning. Understands Mason and English makes of mules. Has worked in mule room sixteen years, five years as second hand and a year and a half as overseer. 28 years old; married; steady and temperate. Would like to get work in N. E. or New York states. Has worked on colored hosiery yarn and filling. 1822, Textile World Record.

Overseer Ring Spinning, spooling and warping wishes a position. A married man, with good experience. Worked on sheetings, shirtings, jeans, grain bags. 3152, Textile World Record.

Supt. of Cotton Mill, or overseer of mule or ring spinning is open to a position; 16 years' experience in Northern mills, on yarns, denims, awnings, apron checks, bicycle suitings, shirtings, etc., etc. Familiar with all well-known makes of cotton machinery; 29 years old; American; married. Can give references from large Massachusetts mills. 1527, Textile World Record.

Overseer of Cone Winding and spooling or ring spinning, who understands Universal, Foster, Broadbent and Payne winders, and Whitin and Mason frames, desires a position. Has worked on carded and combed yarns from 4's to 160's; also, mercerized, gassed and bleached yarns from 2 to 8 ply. Young man; American; married, and can give satisfactory references from large mills. 1960, Textile World Record.

Overseer of Spooling, warping, beaming, slashing and web drawing. Age 37; married. 3010, Textile World Record.

Overseer of Spinning. Age 34; married. Good experience. 20s to 90s Egyptian and American cotton. 3125, Textile World Record.

WOOLEN SPINNERS.

Roll Coverer wants an opening for work. Can cover cotton or worsted rolls, make aprons, or better, has had large experience. Can furnish tools. Work by piece or day. 1803, Textile World Record.

Superintendent woolen mill. Age 47; English; married. Wants New England or Middle States. 10 years' experience in first-class N. E. mills. 2028, Textile World Record.

Overseer of Warping, Spooling and Winding. Dress goods and cloth. Will not go to Canada. Aged 40; married. Good experience. References. 3027, Textile World Record.

Woolen Finisher. First-class. Familiar with all classes of goods and machinery. Can take full charge from loom to case. Has always been very successful. 1244, Textile World Record.

Boss Spinner. Age 34; Scotch. Worked on all wool, cotton and wool and shoddy mixes. Will not go West, South or to Canada. References. Good experience. 3032, Textile World Record.

Overseer Woolen Spinning. Cassimeres, beavers, kerseys, dress goods, flannels, etc. Good experience. 3177, Textile World Record.

COTTON WEAVERS.

Superintendent of cotton weaving and spinning mill. English. Quilts, damasks, brocades, ribbons, etc. 3175, Textile World Record.

Overseer of Weaving. Good experience and reference. Worked on lawns, sheetings, sateens, dimities, fancies, etc. 3188, Textile World Record.

Overseer Cotton Weaving. Plain and a variety of fancies, lenos, etc. Good experience. A young man; English; married. 3147, Textile World Record.

Overseer of plain cotton weaving. Age 27; American; married. Familiar with Whitin, Mason, Colvin and Draper looms. Worked on prints, sheetings, cambrics, lawns, twills, etc. 3143, Textile World Record.

Overseer of Weaving. Sheetings, sateens, ginghams, and dimities. Will not go South. 3116, Textile World Record.

Overseer of Weaving. Worked on sheetings, twills, sateens and fancies. Wants not less than $18 per week. 3157, Textile World Record.

Practical Boss Weaver and loom fixer wants position. Good and long experience. Good record for big production; good quality and for being a good manager of help, and the getting and keeping plenty of good hands. A sober and steady man. Will go anywhere. Either cotton, woolen or jute. 1806, Textile World Record.

WOOLEN WEAVERS.

Overseer of Weaving, also designer. Men's wear, woolen and worsted, and fancies of all kinds, cotton worsteds, dress goods. Knowles and Crompton looms. Age 35. 3056, Textile World Record.

Overseer of Weaving, or would take good second hand job. Age 42; married. Worked on dress goods, suitings, plaid backs, cloakings, meltons and other classes of goods. Worked on Crompton & Knowles loom. 3016, Textile World Record.

Boss Weaver or assistant superintendent Worked on all kinds of worsteds and woolens. Crompton & Knowles looms. Wants place at once. Middle aged; English; married. Good experience. Excellent references. 3062, Textile World Record.

Boss Weaver. Aged 38; married. Cassimeres, beavers, kerseys, dress goods, flannels, blankets. Worked on Crompton & Knowles broad looms Good recommendation. 3066, Textile World Record

Overseer of Woolen Weaving, or would take a secondhand job. 35 years old; married. Familiar with Crompton & Knowles looms. Good references. 3089, Textile World Record.

Overseer of Weaving or designer. Age 29. American; married. Thibets, meltons, kerseys, worsteds and cotton worsteds. Crompton & Knowles looms. Good experience. First class recommendation. 2052, Textile World Record.

Overseer of Weave Room, designer or assistant superintendent Wide experience. Cassimeres, dress goods, blankets, flannels, etc. All patterns of Knowles & Crompton looms, Davis & Furber, spooling, dressing and weaving machinery, Worcester warp compressor. 1838, Textile World Record.

Boss Weaver, second hand or loom fixer. Age 30; married. Wants $3 per day. Men's wear, dress goods and all kinds of fancy worsteds. Crompton & Knowles looms. Reference. 3182, Textile World Record.

Boss Weaver and designer. All grades of fancy dress goods, woolen and worsted, cotton and cotton mix kerseys, coverts and venetians. Plain and fancy men's wear. 3181, Textile World Record.

Boss Weaver wants position. Very wide experience. White and colored, plain and fancy. Understands all kinds of looms. 335, Textile World Record.

DYERS.

Secondhand Dyer. Cotton piece and cotton interwoven with paper. Experience with all classes of goods on a small scale. Aged 23; German descent; unmarried. Address 3171, Textile World Record, Boston.

Boss Dyer and bleacher. Scotch. Good experience and references. Underwear. 3195, Textile World Record.

Dyer or superintendent of dyeing and finishing. Age 34; English; married. Not less than $3.50 per day. All classes of woolen, worsted, mixed and cotton piece goods, bleaching, mercerizing. Can take charge from loom to case. 3121, Textile World Record.

Boss Dyer in a 3 to 5 set mill, or secondhand dyer, Raw stock and shoddy. Wants Mass., R. I., or Conn. 3187, Textile World Record.

Boss Dyer in woolen mill. Would consider a good second hand job. Worked on broadcloths, dress goods, raw stock. Won't go South or to Canada. 3180, Textile World Record.

Superintendent of cotton bleachery is open to a position. Excellent experience. American; married; aged 37. Familiar with cambrics, sheetings, shirtings, lawns, sateens, drilling and fancy weaves. 3153, Textile World Record.

Fancy Dyer. Aged 37; American; married. Cotton, wool and silk. 3158, Textile World Record.

Overseer of Dyeing. Men's wear and dress goods, loose wool, piece dyes and yarns. Good experience. 3161, Textile World Record.

Dyer. Worked on piece dyes, wool, cotton, shoddy yarns, rags and union dyes and carbonizing. Wants place at once. Good experience and references. 3092, Textile World Record.

Wanted, position as boss dyer and bleacher of cotton yarns, long and short chain and skein yarn. Good references. 3145, Textile World Record.

FINISHERS.

Finisher and assistant superintendent wants position. Age 31; American; married. Good experience on all kinds of goods, especially on unions and satinets. Good references. Will not go West, South or to Canada. 3139, Textile World Record.

Boss Finisher. 25 years' experience on all classes of goods, woolen and worsted and cotton mixtures of all grades. 3142, Textile World Record.

Boss Finisher. American. Cheviots, cassimeres, beavers, dress goods, etc. Wants $2.50 to $3 per day. 3123, Textile World Record.

Boss Finisher. Mostly on fancy cassimeres and face finished goods. Familiar with most all makes of finishing machinery, in both dry and wet finishing. An expert in overhauling and fixing up old finishing machinery, and at setting up and starting new machinery. 3200, Textile World Record.

Overseer of Finishing Room. Cut and full fashioned balbriggan ribbed goods. Familiar with Union Special, Wheeler & Wilson, Willcox & Gibbs, Merrow, etc. Excellent references. Address 3168, Textile World Record, Boston.

Woolen Finisher. Age 35; American; married; Wants $2.50 or $3.00 per day. Good experience. 3138, Textile World Record.

Overseer of Cloth Room. Age 37; American; married. Wants $18 per week or over. 3110, Textile World Record.

Overseer of Finishing. Age 33; American; married. Meltons, coverts, cheviots, flannels, mohairs, etc. Wants position in New England, preferably Rhode Island. 3129, Textile World Record, Boston.

Foreman of cotton finishing room. Eight years' practical experience on napping machines, starching and calendering. Worked in mills in Italy and America. Married. 3155, Textile World Record.

KNITTERS.

Foreman of Knitting Room. Age 29; American, unmarried. Fleece of all kinds and gauges. Balbriggan from 20 to 30 gauge. Flat work wool goods. Tompkin Bros. and Campbell & Clute machines. Will not go South. 3204, Textile World Record.

A young man, of several years' experience, as foreman knitter on single and double thread flat goods, plushes and fleeces, wants a position of any kind where he will have a chance to learn latch needle knitting. No reasonable offer refused. 3038, Textile World Record.

Boss Knitter or Assistant Superintendent wants position. First class latch needle knitter on ribbed underwear and balbriggans, or assistant superintendent of a ribb plant. Can furnish best of references, having fifteen years' experience on McMichael and Wildman, Scott & Williams, Stafford & Holt and all others including Tompkins and Coopers spring needle machines. Wages reasonable. Address Rib & Balbriggan, care Textile World Record, Boston, Mass.

Superintendent of an underwear mill. English; married; middle aged. 3176, Textile World Record.

Boss Knitter or Sewing Machine Fixer. German; married. Familiar with all makes of knitting and finishing machines on ladies' underwear. Will not go South or to Canada. 3128, Textile World Record.

Boss Knitter or fixer. Would like to work with boss finisher on sewing machines. American; age 32. Familiar with McMichael & Wildman, Nye & Tredick, Snyder & Fisher, Scott & Williams and other makes of latch needle machines, Tompkins spring needle machines, and understands winding. 3118, Textile World Record.

General Manager or superintendent of ribbed underwear mill. American; married. Been in underwear business eleven years as superintendent and manager. First-class references as to character and ability. 3100, Textile World Record.

DESIGNERS.

Designer on any class of dress goods, waistings, mantle cloths, fine shirtings, etc. 3203 Textile World Record.

Assistant Designer or asst. superintendent. Dress goods and men's wear. Age 25; Austrian; unmarried. Wants position in Philadelphia or suburbs. 3193, Textile World Record.

Designer on cotton, or assistant on woolen, worsted or Jacquard work. Age 31; American; unmarried. 3190, Textile World Record.

Designer in small mill or assistant in larger concern. Serges, cassimeres, shawls, and fancy worsteds and cotton goods. Wants only New England or Pennsylvania and New York. 3191 Textile World Record.

Designer. Age 29; American. Understands Jacquards and would like to get into a mill making ladies' dress goods, etc. 3186, Textile World Record.

Designer or superintendent. A German, 26 years of age. Dress goods and men's wear. Experienced in Germany and this country. 3163, Textile World Record.

Assistant Designer or assistant superintendent of woolen or worsted mill. A young man; American; unmarried. Men's wear, dress goods, silk brocades, damask, etc. 3160, Textile World Record.

Designer, assistant designer or assistant superintendent. German. Woolen and worsted men's wear and ladies' dress goods. Experienced in Germany and a short time in this country. 3166, Textile World Record.

Designer or superintendent. Ginghams, crepe, jacquards, cycle tires, filter cloths, vesting cloth, etc. Good recommendations. Middle aged man; English; married. Address 3169, Textile World Record, Boston.

Weaver to Designer

THE textile industry of this country offers good opportunities for those of the craft who desire to advance. It was not long ago that the specially trained textile worker had to be imported. The necessity for this no longer exists. The textile Courses of the International Correspondence Schools are the means by which thousands of ambitious textile workers have been able to advance to the better positions in their craft, thereby bettering their condition in life.

Oswald C. Drechsler, of Maynard, Mass., was a weaver when he enrolled with the I. C. S. The fact that he was a student in these Schools was responsible for an opportunity being offered for advancement. The knowledge gained in his Course enabled him to qualify for the position. He is now a textile designer in the Assabet Mills, at more than double his former salary.

By our method of training, by mail, thousands of ambitious textile workers have been able to advance in salary and position. You do not have to give up your present employment—we train you in your spare time.

We can help you qualify for a position as Superintendent; Designer; Boss Carder; Boss Spinner; Boss Weaver; Bookkeeper; Stenographer; Etc.

Write, stating which subject interests you.

International Correspondence Schools

BOX 886, SCRATNON, PA.

MISCELLANEOUS.

Asst. Superintendent of dyeing, printing and finishing plant. Experienced in cotton and silk and capable of turning out finished product. American; 27 and married. Best of references. 3136, Textile World Record.

Overseer in winding, spooling and thread dressing. Age 34; Scotch; married. Also had some experience in beaming. Shoe and corset lacing, plain and fancy braids and tapes, fine ginghams and dress goods. 3192, Textile World Record.

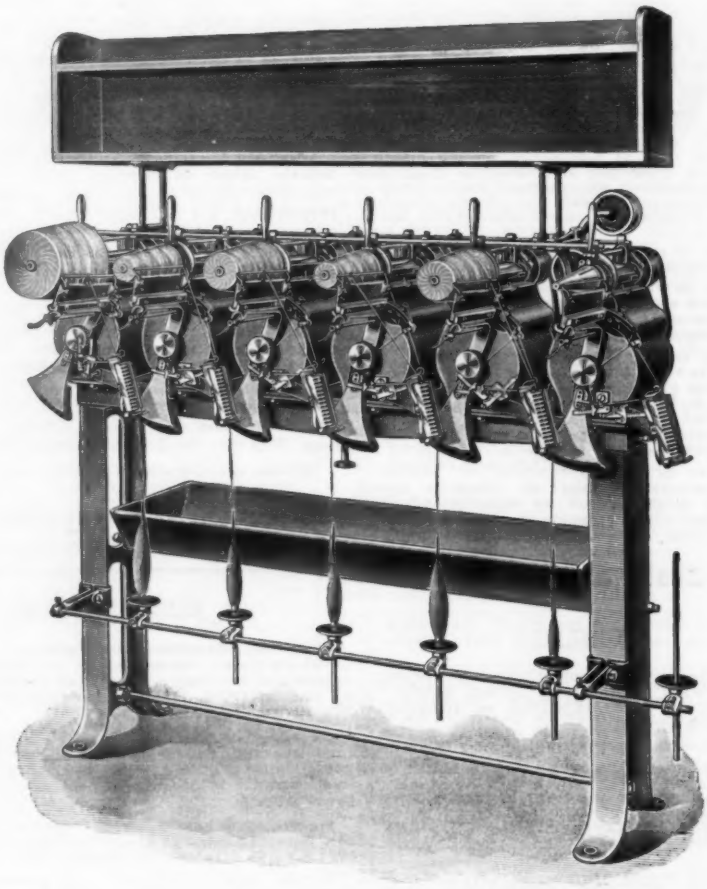
Master Mechanic in cotton or woolen mill or cotton finishing plant. American; married. Good experience and reference. 3189, Textile World Record.

Salesman for shoddy or mill supply house, or machinery salesman. Familiar with all kinds of textile machinery. 3194, Textile World Record.

Second Boss or in advisory capacity for jacquard weaving. Familiar with almost every line of silk fabrics, also cotton backs, tapestry and upholstery goods, hammocks, table and bed covers, ribbons, etc. 3135, Textile World Record.

Loom Boss or asst. superintendent. All kinds of worsted goods for ladies' and gentlemen's wear and various classes of cotton goods. Worked in English mills and also in this country. 3151, Textile World Record.

Mechanical Superintendent and master mechanic of cotton and cotton finishing mill desires position. Mechanical engineer, technical graduate with broad experience in mill construction, maintenance and management, power plant installation, power transmission and design and construction of machinery. Best of references. Address "Mechanical," Textile World Record, Boston, Mass.



Thousands of machines running continuously in this country and in Europe, have more than substantiated all claims hitherto made. What every other Winder may do, No. 50 does better; what no other Winder can do, No. 50 does with success.

Universal Winding Company

95 SOUTH STREET, BOSTON

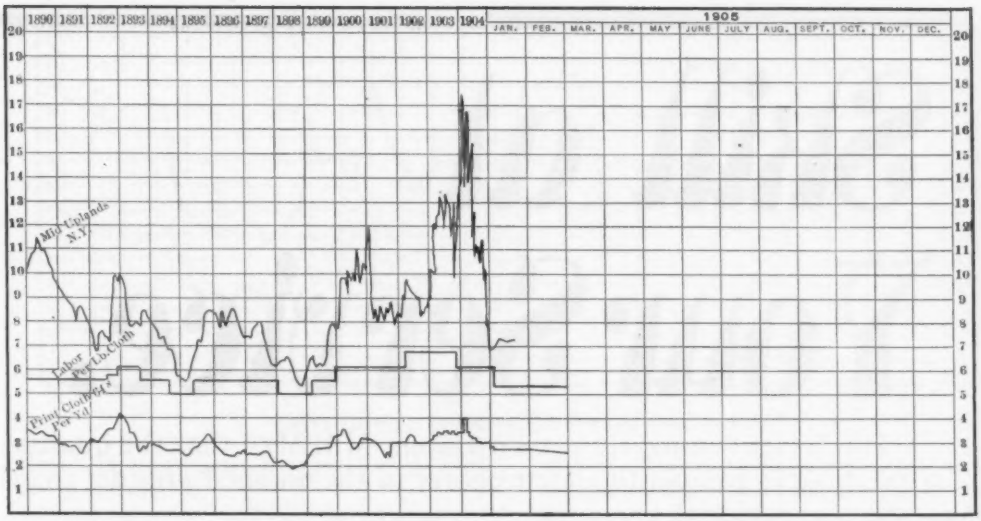

1890 1891 1892 1893 1894 1895 1896 1897 1898 1899 1900 1901 1902 1903 1904
1905
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.
Mdl. Uplands N.Y.
Labor Per Lb. Cloth
Print Cloth Per Yd.

CHART SHOWING RANGE IN THE PRICE OF COTTON TO DATE.

The Cotton Market.

Trade in yarn and cloth abroad is decidedly better. The Southern planter, having sold a large part of the present crop at high prices early in the season, is holding on to the rest of it with a tenacity that promises to make the cotton remaining in his possession a part of next year's crop as far as actual supply is concerned. The cotton goods market abroad is thus described by the Cotton Gazette:

"The change is mainly due to remarkably good local trade conditions, not only effective in themselves (for they have been current for some months past), but almost more effective on account of the support which they are receiving from many trade centres on the Continent, and in less particular but important centres in the industrial markets of America, North and South.

"Beginning at home, which appears to be the mainspring of industrial enterprise, and the soundest industrial and merchanting market in the world for goods, otherwise the trade revival would not be first felt here, and completely felt as it is today; we find that commitments ahead for goods go to lengths which are absolutely unprecedented in the present, or even the past generation. A starved world has raised a clamor for goods, quite irrespective of price, that will keep the spindles and looms of Lancashire busy for at least one year, if not for longer, upon such a profitable basis, as the greatest optimist, a year ago, would never have conjectured.

"This demand for world's clothing is now being reflected on the Continent; its influence is already being felt in industrial circles in America; in a limited degree it has been felt for months past in the Far East. War or no war."

The buyers of cotton goods throughout the world have apparently made up their minds to improve the present opportunity afforded by 8 cent cotton, and are restoring to the normal size the stocks that were depleted during the period of 12 to 15 cent cotton. While the American mills are not sharing in this revival of foreign trade, because their product is consumed at home, yet they are affected by it because of the influence it has upon the price of raw material.

The movement of cotton since Sept. 1, as com-

C. M. BLAISDELL, Pres. and Treas. G. A. BLAISDELL, Vice Pres. and Secy.
Established 1860—Incorporated 1893.
THE S. BLAISDELL, JR., CO.,
COTTON, EGYPTIAN PERUVIAN
American Long Staple a Specialty. Shipments direct to mill from Egypt, Peru and all American Southern Points.
CHICOPEE, MASS.
Cotton Waste Purchased on Yearly Contract from Mills.

WEIMAR BROS. MANUFACTURERS OF Cotton Mercerized Tapes,
SPOOL TAPES, BINDINGS AND NARROW FABRICS FOR UNDERWEAR AND OTHER TRADES.
Phone Connections. Works, 2046-48 Amber Street. PHILADELPHIA, PA.

Skill at Your Service.

It is a fact commonly known among Mill Men that the quality of the fiber is frequently much poorer in the finished product than in the raw material.

To those who have carefully investigated these facts the cause is traced directly to the use of harsh alkalies in the scouring process.

Their action is so severe that the tender wool fiber is deprived of many of its natural properties and loses much of its softness and elasticity.

Such conditions furnished the demand that produced

Wyandotte Textile Soda.

This new product, Wyandotte Textile Soda, is the result of applied chemistry and its wonderful success proves its effectiveness.

None Genuine except with a card bearing this Trade Mark

In Every Package.

While it is positively free from all caustic it yet possesses unusual detergent properties, and will not injure the delicate fiber in any way. To try it is to know its value. Order from your supply house or write us for further information.

This Soda was given the highest award — Gold Medal — at the St. Louis Exhibition.

The J. B. FORD CO.,

Sole Manufacturers,

WYANDOTTE, MICH.

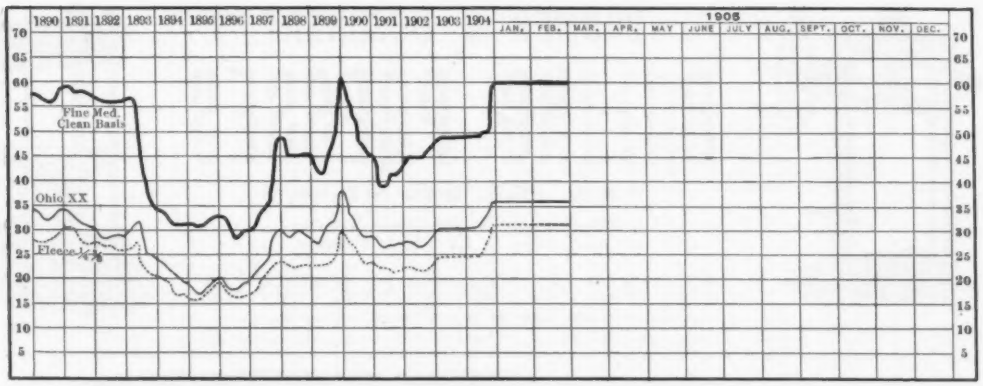


CHART SHOWING RANGES IN THE PRICE OF WOOL TO DATE.

pared with former years, is reported by the Chronicle as follows:

1904-05	9,258,952
1903-04	8,577,559
1902-03	8,747,317
1901-02	8,624,385
1900-01	8,241,923
1899-00	7,601,395

The world's visible supply on Febuary 24 is estimated by the same authority at 4,214,432 bales; as compared with 3,767,985 bales at same date, 1904; 3,950,562 bales in 1903, and 4,440,065 bales in 1902.

The Wool Market.

Dullness has been the rule for the past month in the wool market. Values have not declined, but the few buyers on the market have found sellers more inclined to part with the staple. There is a scarcity of wool and this serves to keep prices at the present high figures. Medium and coarse wools are the weakest spots in the market.

The wool growers in the West have disposed of most of the new clip on the sheep's back, and contracts of this kind are still being made, although in restricted volume owing to the decreased quantity to be thus sold, and the extreme views of owners of flocks regarding prices. The wool growers are not affected by many of the influences that cause frequent changes of sentiment in the East. Thus the present dullness has no effect on the man in the West who owns sheep on whose backs the wool is not yet sold.

The mills are well employed. As is always the case, even in the best times, some mills are short of orders or even idle, but as a rule the woolen and worsted machinery of the country is consuming wool and wool substitutes at more than the average rate. Reports from abroad are to the effect that the wool market shows signs of weakening still further. The loss of 3,000,0000 pounds of imported wool by fire at Boston strengthened foreign wool in this market for immediate delivery, but can, of course, have no lasting effect, as the quantity is too small to affect the general supply.

Wool and Woolen Goods Made **NONSHRINKABLE**
by the use of "Nevershrink Process."
May be applied at any stage of manufacturing. Write for Booklet.
CHARLES H. HEYER,
1501 Real Estate Trust Bldg. Philadelphia, Pa.

FOR WOOL
Nevershrink
TRADE MARK

STANDARD QUALITY COMBED RAMIE TOPS and NOILS a Specialty. **RAMIE YARNS in All Numbers for All Purposes.**

Wool, Mohair, Camel Hair, Silk, and Ramie Tops and Noils.

FRANK A. TIERNEY,
Wool, Tops, Noils, Yarns.

Woolen, Worsted, Mohair, Ramie and Silk Knitting Yarns.

All Kinds of Yarn for Weaving Purposes. Special Fibres and Novelties for Woolen, Cotton and Silk Manufacturers.
Room 203, Wool Exchange Building, 260 West Broadway, New York.

KNUCKLE JOINT.

BOOMER & BOSCHERT

BALING PRESSES

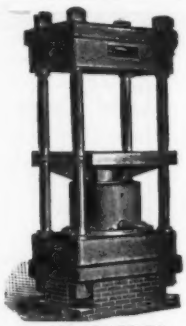
ARE THE STANDARD

Hydraulic or Knuckle Joint
Any Size .. Any Power

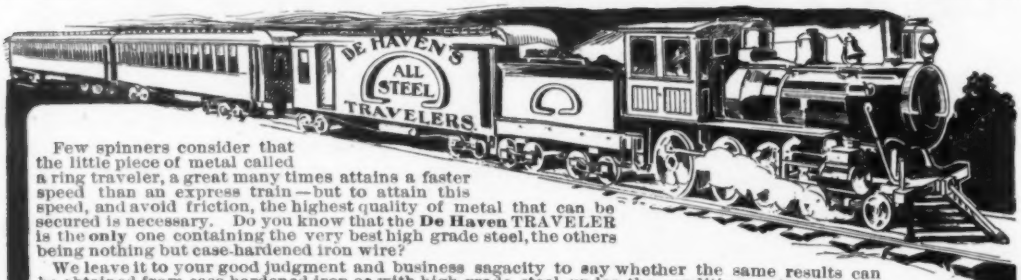
Boomer & Boschert Press Co.

338 West Water S., SYRACUSE, N. Y.

Southern Agent, A. H. WASHBURN, Charlotte, N. C.



HYDRAULIC.



Few spinners consider that the little piece of metal called a ring traveler, a great many times attains a faster speed than an express train—but to attain this speed, and avoid friction, the highest quality of metal that can be secured is necessary. Do you know that the **De Haven** TRAVELER is the **only** one containing the very best high grade steel, the others being nothing but case-hardened iron wire?

We leave it to your good judgment and business sagacity to say whether the same results can be obtained from case-hardened iron as with high grade steel, under the conditions which govern ring spinning.

DE HAVEN MFG. COMPANY,

50-52-54 Columbia Heights, Brooklyn, N. Y.

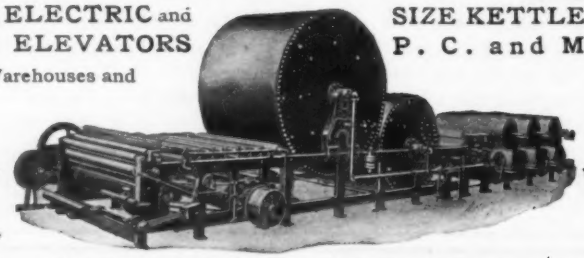
The COHOES SLASHER.

BELT-DRIVEN, ELECTRIC and HAND-POWER ELEVATORS

For Cotton Mills, Warehouses and Factories.

PULLEY BLOCKS.

OVERHEAD TRACKS.



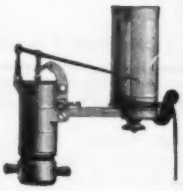
SIZE KETTLES. REPAIRS for P. C. and M. MULES and EMPIRE LOOMS.

WATERWHEEL GOVERNORS.

The COHOES IRON FOUNDRY & MACHINE CO. Cohoes. N. Y.

A Crosby Indicator

In the Hands of a Competent Man Will Increase the Efficiency of Your Plant and Cut Down Your Coal Bill. Faultless in Design. Perfect in Workmanship.



Write for Catalogue.

TRADE MARK CROSBY

Pop Safety Valves
Pressure and Vacuum Gages
Water Relief Valves
Blow-off Valves
Rubber Pump Valves

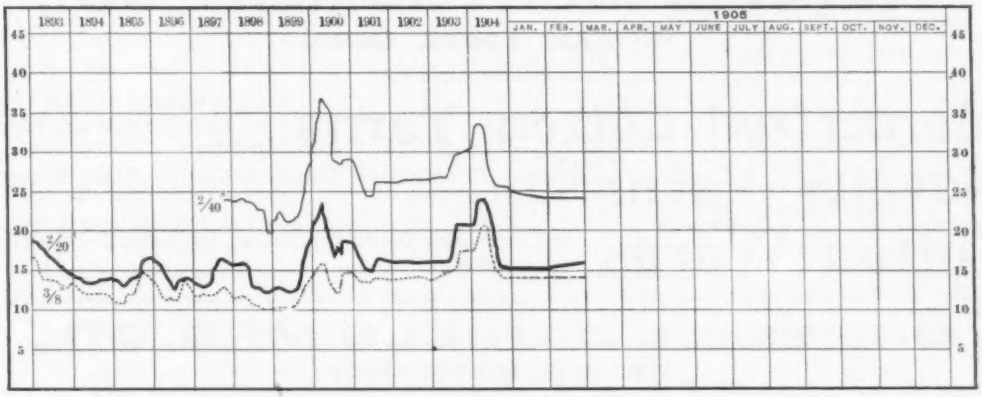
Recording Gages
Single Bell Chime Whistles
Feed Water Regulators
Lubricators—Oil Cups
Gage Glass, Water Gages, Etc.

CROSBY STEAM GAGE AND VALVE CO.

Stores:
BOSTON, NEW YORK, CHICAGO, LONDON

Office and Works:
BOSTON, MASS.

Yarn Department.



GRAPHIC CHART SHOWING RANGE OF PRICE OF COTTON YARN TO DATE.

Eastern Yarn Market.

The yarn market is more active and a good volume of business is being booked. Spinners are sold ahead for several months, and there is a general disposition on the part of buyers to place contracts not only to cover immediate requirements, but also to discount undeveloped needs. This tendency is but a natural result of the improved demand for goods from the jobber and the retailer, which is world wide in extent, and apparently brought about by 8 cent cotton. Medium and coarse counts show the greatest improvement. The demand for mercerized yarn continues good We quote as follows:

Eastern Cops.

6's	15
8's	15
10's	15¼
14's	16¼
16's	16¾
18's	17¼
20's	17¾
22's	18¼
24's	18¾
26's	19¼
30's	20¼
34's	21¼
36's	21¾
40's	22¾

On cones, ¾c. more up to 14's; 1c. more from 15's to 22's; 1½c. from 23's to 35's, and 2c. above that.

Eastern Two-Ply Skeins, Carded Peeler.

12's	17
14's	17½
18's	18½
20's	19½
24's	21
26's	22
30's	23
36's	24
40's	25
45's	29
50's	33
55's	37
60's	41

Eastern Two-Ply Warps, Carded Peeler.

2/30's	23
2/36's	24
2/40's	26
2/45's	30
2/50's	34
2/60's	42

Egyptian Weaving Yarns.
Single Skeins Combed.

30's	33
36's	35
40's	37
45's	39
50's	42
55's	45
60's	48
70's	57

Two and Three Ply Skeins, Combed.

30's	34
36's	38
40's	40
45's	42
50's	46
55's	49
60's	53
70's	63

Carpet Yarns.

60-yd. double reel filling	29
No. 2 60-yd. double reel filling	28½
1st quality ⅝	24
2d quality ⅝	23
60-yd. double reel filling skeins (on cops)	10 11
120-yd. single reel cotton (on cops)	11
Wool ingrains, 42-yd. common	7
medium	8-8½
best	11½
extra best	15
light supers	18½
Super jute, 42 yard	7½
Super jute (light), 42 yard	7½-8
Velvet wool, spun, 135 yds., white	34
Gray	33

THE J. R. MONTGOMERY CO.,

Windsor Locks, Conn.

MANUFACTURERS OF

Mercerized Cotton Yarns Gives the High Silk-Like Lustre in Knit Goods and Woven Fabrics.

Novelty Yarns Boucle, Bourette and Spirals, in Cotton, Wool, Worsted, Mohair and Silk.

Cotton Warps on Beams, Jack Spools and Tubes. In Fancy, Twist, Colors and Printed.

GREENE & DANIELS MFG. CO.,

COMBED, CARDED AND GASSED

Yarns, Threads, Twines and Chain Warps,

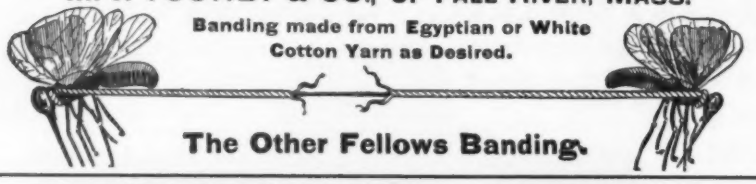
Colored and Bleached Yarns Furnished in any manner desired by the trade.

Pawtucket, R. I.

THESE MULES CANNOT BREAK THE BANDING —MADE BY—

M. J. TOOHEY & CO., OF FALL RIVER, MASS.

Banding made from Egyptian or White Cotton Yarn as Desired.



The Other Fellows Banding.

MONUMENT MILLS,

Manufacturers of

White, Colored, Fancy and Double Twist

COTTON WARPS

HOUSATONIC, MASS. 4s to 60s.

Dana Warp Mills

WESTBROOK, ... MAINE

White and Colored Warps 6s to 50s Single and Ply

Mule Cops From 30s to 50s from American & Egyptian Cotton

Philadelphia Yarn Market.

The demand for cotton yarn has been considerably better the past few weeks. Buying has been stimulated considerably by the firm tone of the cotton market. With cotton holding firm, at the recent advance, there ought to be much better business done by the jobbers and manufacturers which will help the yarn market considerably. Spinners are fairly well supplied with orders and are in good position to stand for an advance. Some numbers have advanced 1c. per pound over the lowest prices they reached in January. The demand has been particularly good for two-ply weaving yarn, and mills are generally sold up for the next two or three months.

The movement on the part of the farmers in the South to hold cotton off the market has been so general as to have a marked effect on the price of cotton, and in spite of paper quotations, the best grades of cotton are being held in the South at 8 1/4 to 8 1/2c., which is 1/2 to 3/4c. above the paper quotations.

During the past few weeks there have been meetings of spinners, cotton growers and dealers, at which vigorous action has been taken to sustain prices and to enforce compliance with contracts. Spinners have been particularly active in dealing with the question of cancelations of high-priced orders, which has been attempted by a number of manufacturers recently, and there is a concerted action on the part of spinners to overcome this trouble. There a e still some yarns being sold for future contracts by houses that seem willing to discount the cotton market, but prices for quick deliverv are firm, at about the following rates:

Southern frame spun cones:—

7's and Coarser	14½-15
8's and 9's	14½-15
10's	15
12's	15½
14's	16
16's	16½
18's	17
20's	17½
22's	18
24's	18½
26's	19
30's	20
40's	25
50's	31

Southern high grade mule yarn:—

	Cones.
10's	16
12's	16½
14's	17
16's	17¾
18's	18¼
20's and 22's	18¾-19½
24's	20

PAULSON, LINKROUM & CO.
Successors to BUCKINGHAM, PAULSON & CO.
Commission Merchants
COTTON YARNS of all Descriptions
83 Leonard St., NEW YORK
302 Chestnut St., Phila. 210 Munroe St., Chicago, Ill.
Cash Advances, Cash Sales and Prompt Returns. Consignments and correspondence solicited.

JAMES E. MITCHELL CO., COMMISSION MERCHANTS.
Cotton Yarns
FOR ALL PURPOSES.
122-124 Chestnut Street, PHILADELPHIA, PA.
Brown Building, 183 Summer Street, BOSTON, MASS.

CATLIN & CO.,
Cotton Yarns
345 Broadway, NEW YORK.
67 Chauncy Street, BOSTON.
206 Chestnut Street, PHILADELPHIA.
605 Medinah Temple, CHICAGO.

Harding, Whitman & Co.,
Dry Goods Commission Merchants,
COTTON AND WORSTED YARNS.
BOSTON. NEW YORK. PHILA.
CHICAGO. BALTIMORE. ST. LOUIS.

A. D. SALKELD & BRO.,
With FRED'K VIETOR & ACHELIS,
YARNS.
66-72 LEONARD STREET, - NEW YORK.

Fred Sternberg & Co.
530 Broadway, - NEW YORK.
MERCERIZED TURKEY RED GASSED } COTTON YARNS.

E. D. LORIMER & CO.
COTTON YARNS } ALL NUMBERS
MERCERIZED YARNS } FOR ALL PURPOSES
346 BROADWAY, NEW YORK.

MOELLER & LITTAUER,
SILK, WORSTED, WOOLEN YARNS COTTON AND MOHAIR
Polished Threads and Tinsel. Artificial or Wood Silk.
Mercerized, Turkey-Red, Fine Gassed Yarns.
109 GREENE ST., NEW YORK

CAPACITY, 20,000 Spindles. **ORSWELL MILLS** FITCHBURG, MASS.

COMBED **COTTON YARNS** CARDED

In Chains and Skeins, on Balls, Beams, Spools—Single or Twisted.

THE MALCOLM MILLS CO.,

MANUFACTURERS OF

FANCY YARNS and POLISHED THREADS.

Offices: 229 Chestnut St., Philadelphia.

Mills: Frankford, Pa.

KROUT & FITE MANUFACTURING CO.,

Manufacturers of

Silk, Cotton and Mercerized Narrow Fabrics

Spool Tapes a Specialty.

Telephone Connection. Office and Mill, Allegheny Ave. and Emerald St., PHILADELPIA.

WALCOTT & CAMPBELL SPINNING COMPANY

Fancy Hosiery Yarns

IN ALL COLORS

New York Mills, Oneida Co., New York.

A. G. THURSTON & SON,

MANUFACTURERS OF

Fluted Rolls, Pressers for Flyers

AND GENERAL MACHINERY

Specialties made of Renecking, Refluting, Filing and Honing of all kinds of Rolls. Flyers Repaired and Fitted with any desired style of Pressers, Spindles Straightened Restepped and Retopped.

Box 528. FALL RIVER, MASS

Indian Orchard Company

Cotton Warps and Yarns. In Gray and all Colors, Single or two or more Ply, and Cable Cord.

Novelty Yarns. in Various Patterns, Colors and Twists.

Carded and Colored Cotton. For Mixing with wool. Machined or in Roving.

Indian Orchard, Mass.

E. MORGAN, PRES. H. K. WRIGHT, TREAS. W. C. GODFREY, AGT.

Southern frame yarn, lower grades:—	
6's and 8's	14½
10's	15
Eastern cones (high grade quality):—	
10's	16½
12's	17
14's	17½
16's	18¼
18's	18¾
20's and 22's	19¼-19¾
Skein yarn (mostly Southern):—	
4's to 8's soft	15
10's to 12's	15½
14's to 20's	15½-16½
22's	16½
14/2	16
16/2	16½
20/2	17
30/2	19
40/2	24
16/3 slack	16½
12/3 slack	16¼
8/3 carpet	15
8/3 slack	15
9/4 slack	15
Warps (mostly Southern):—	
10's to 12's	15½
14's	16
16's	16½
20's to 22's	16½-17
26's	18
14/2	16½
16/2	16¾
20/2	17
24/2	18
30/2	19
40/2	24
Mixed colored yarns (mock twist, half colors):—	
6's to 10's	16-16½
12's to 14's	17-17½
16's to 18's	19-19½

Silver and jaeger, 1½c. over white.

Mock Egyptian, 2c. advance over white.

Egyptian, 4c. to 5c. above best quality white.

Worsted Yarn.

Spinners continue busy on old orders and new orders are being placed from time to time in small amounts. Prices are firmly maintained on all yarns from a high 3/8 blood quality up, but on 1/4 blood yarn and low 3/8 blood there is an easier tendency which may continue or may not. Some manufacturers say they intend to buy as sparingly as possible, but they also say that they are buying yarn earlier than they believed necessary, as orders for certain cloth had been secured. This is on account of dress goods and the demand is for Panama cloth.

It does not seem as if these yarns would go higher and certainly the demand for them is narrowing to the dress goods manufacturers. The weavers of men's wear are substituting yarn of

O. K. SOAP CO.
MANUFACTURERS
FINE TEXTILE SOAPS,
SILKINE,
AND LISLE SILK FINISH
For Fast Black and Colors. Softness and lustre.
Write us to-day.
968 North Franklin Street, - PHILADELPHIA.

LINEN YARN IMPORTER.
HUGHES FAWCETT, 115 Franklin Street, NEW YORK.
Flax, Hemp and Jute Line and Tow Yarns,
For Weaving Purposes.
Linen Jacquard Harness Twines,
Fine Cotton Harness and Heddle Twines,
For Cotton, Silk, Woolen and Carpet Manufacturers.
Correspondence solicited. Samples promptly furnished.

Mercerized and Plain
Skein, Warps,
Cones, Cops,
Tubes
COTTON YARNS
426 and 428
Market St., Phila.
Theo. H. Strouse & Co.

Ballou Yarn Co.
PROVIDENCE, R. I.
Harness and Seine Twines and other Job
Gassing, Winding, etc. All Numbers.
GASSED YARN SPECIALTIES

American Cotton Yarn Exchange
COMBED and CARDED
COTTON YARNS
From Northern and Southern Mills.
American, Egyptian,
Peruvian and Sea Islands.
ARNOLD B. SANFORD, Pres. and Gen. Mgr.
OFFICES: 67 Chauncy St., Boston.
240 Chestnut St., Philadelphia.
108 Franklin St., N. Y., with James Talcott.

F. C. BARTON
MANUFACTURER OF LILY BRAND NARROW FABRICS
RIBBONS, TAPES, BINDINGS & NON ELASTIC WEBBINGS
54 FRANKLIN STREET, NEW YORK

ALLEGHENY WORSTED MILLS,

Thomas Wolstenholme Sons & Co.,
MANFRS. OF
ALL NUMBERS
SINGLE AND TWO-PLY,
On Cop or in Skein, for Weaving and Knitting Purposes, in White, Natural and Fancy Mixes.

Worsted
YARNS
Sell Direct,
Office and Mills, Frankford Ave. and Westmoreland St., Phila, Pa.

Pocasset Worsted Company,

WORSTED YARNS
IN THE GRAY.

Mills at
Thornton, R. I.

Office
100 Boylston St., Boston, Mass.

CRANSTON WORSTED MILLS.

Worsted and Mohair Yarns—White or colors, in skeins, on spools, cones, or shuttle bobbins.

Novelty Yarns—of Mohair and Worsted. We are the only manufacturers in the United States making these yarns from the raw material to finished product and making yarns only.

Genapped Yarns of all kinds. Doup Yarns. Harness Yarns. For Braids, etc.

DYERS OF YARN AND SLUBBING. BRISTOL, R. I.

French System. B. F. BOYER CO., Bradford System.
MANUFACTURERS OF
WORSTED AND WOOLEN YARNS,
Office and Mill, Delaware and Cooper Streets. CAMDEN, N. J.

Woolen and Merino YARNS
Eaton Rapids Woolen Mills,
EATON RAPIDS, MICH.

EDDY & STREET,
Cotton, Woolen,
Yarns and Braids
Worsted, Spun Silk.
PROVIDENCE, R. I.

RICHARD CAMPION,
SELLING AGENT FOR
Bristol Worsted Mills,
Highland Worsted Mills,
Loridan Worsted Co.,
17 Bank St., PHILADELPHIA, PA.

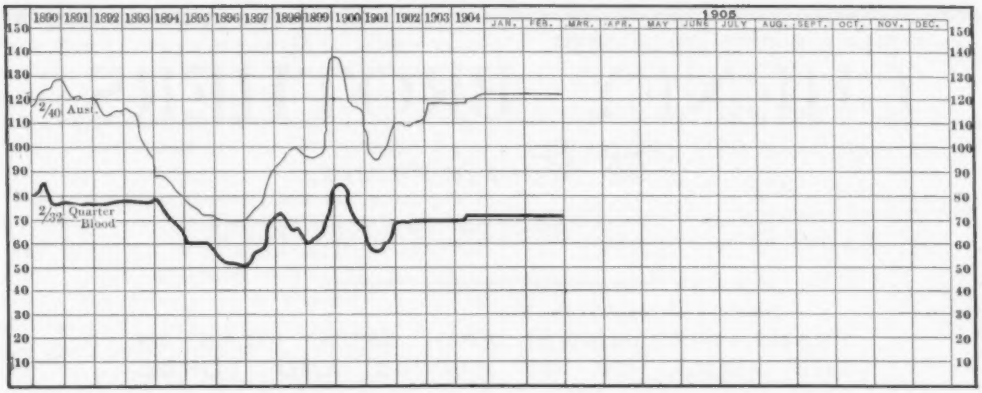


CHART SHOWING RANGES OF PRICE OF WORSTED YARNS.

about half blood quality instead of using quarter blood yarn, because the better grade costs no more than the quarter blood yarn and for this reason buyers of quarter blood yarn say that the prices they are willing to pay today will look very high to them in 30 to 60 days from this time. A 2/36s which was selling last May for 72 cents is now quoted at 87 1/2 to 90 cents per pound, while the price being offered by buyers is 85 cents per pound. Spinners on today's market contend that they cannot reach this price and some spinners are asking as high as 95 cents per pound, although many of them have orders on their books for which they have no spinning instructions which they must deliver at prices 5 to 20 cents per pound under 95 cents. These spinners are making promises of deliveries, but no yarn is being shipped. The spinners continue to press for spinning instructions and threaten to cancel orders booked at the low prices. The weavers cannot give spinning instructions as many of them do not know what size the yarn is to be spun as they have no orders.

The dress goods people are anticipating some good business later, but the trade has not wholly developed. The demand for the men's wear has been for yarn out of which to make mercerized cloth, and much single worsted yarn is being purchased. Cotton worsteds have been selling well and have displaced worsted cloth to some extent. The men's wear weavers that are making fancy worsteds from yarn purchased at low prices early in the season are getting no advance over the actual price at which they purchased the yarn, as cloth offered at a great advance is being turned down by the would be purchasers. Whether the advances desired can be secured later remains to be seen. The situation is certainly complicated. Some spinners are hard pressed to deliver yarn

SILK NOILS AND SILK NOIL YARNS
In White and Colors.
A. T. SKERRY & CO., 47 Leonard Street, NEW YORK.

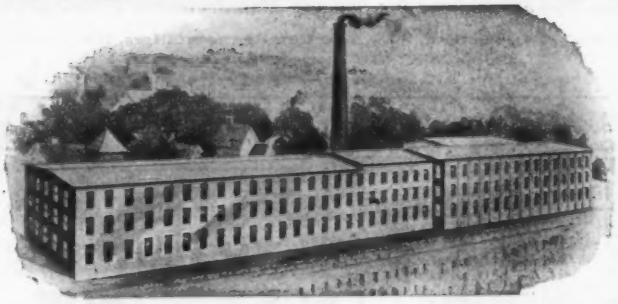
MOHAIR LOOPS, KNOTS AND FANCY YARNS FOR DRESS GOODS & CLOAKINGS.

QUEENSBURY MILLS WORCESTER MASS.

MOHAIR TOPS AND YARNS FOR WEAVING

LUSTRE YARNS FOR SERGE LININGS

ALPACA YARNS



SPINNERS OF MOHAIR YARNS FOR ZIBELINES

DRESS GOODS YARNS
KNITTING YARNS
WORSTED YARNS

MOHAIR

CHENEY BROTHERS,

Silk Manufacturers,

SOUTH MANCHESTER, CONNECTICUT.

TRAMS, ORGANZINE AND SPUN SILKS IN THE HANK, OR ON SPOOLS AND CONES.

SILKS FOR ELECTRICAL USES, INSULATION AND SPECIAL PURPOSES MADE TO ORDER.

KNITTING SILKS, RIBBONS AND PIECE GOODS FOR TRIMMING KNIT GOODS.

Pure Dye and Fast Colors Warranted.

WILLIAM RYLE & CO.,

Foreign and Domestic

Spun Silk Yarns and Noils.

Domestic Thrown Silk of every description. Fine Pure Dye Silks for the woolen trade a specialty. Importers of European and Asiatic Raw Silk.

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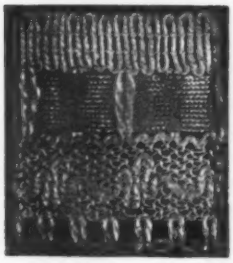
SAUQUOIT SILK MFG. CO.,

INSULATING AND BRAIDING SILKS.

ORGANZINE, TRAM & HOSIERY SILKS.

Fast Dye Organzines for Woolen Manufacturers a Specialty.

Mills: Bethlehem, Pa., Phila., Pa., Scranton, Pa. New York Representatives, Wm. Ryle & Co., 54 Howard St.—Phila. Office, 4015 Clarissa St., Nicetown.—Chicago Office, 210 Monroe St.—Boston Office, 78 Chauncy St.



GEORGE W. CHAPIN,

BRAIDS Cotton, Worsted, Mercerized, Cotton and Silk Twilled. **TAPES** Common, Twilled, Superfine and Plain 18 to 35s, white and colors on spools.

YARNS Cops, Skeins, Warps, Tubes and Cones. **THREADS** on Spools, Tubes, Cones, Unbleached, Bleached and Colors for Manufacturers' use.

CROCHET LACE EDGINGS Latest Styles in Pant Laces.

229 Church Street 231 . . PHILADELPHIA

which they have sold at fair prices. Other spinners who have stood out of the market waiting for an extended advance are looking anxiously for orders and the spinners with large orders booked but no orders to ship are also in a quandary as to where they are coming out on the season's work.

The men's wear manufacturers are alive to the fact that quarter blood yarn is as high in price as a half blood and in consequence are leaving the quarter blood yarn alone and using the better grade. This will lessen the demand and it may force a reduction in values. The weavers hope that later the demand for cloth will increase as it is known that clothing manufacturers have not large stocks and have been holding off so long that when these buyers realize that values are established it is more than probable there will be some good buying at present prices, as it will then be a question of getting cloth and getting it quick. It must be confessed, however, that up to date most of the buying has been for mercerized cloth and cotton worsteds and mills making these grades are well sold up, while the mills making better classes of cloth are not doing so well. The French spinners have some good orders as to volume, but these orders were taken at a low basis of value and on today's market the price of yarn is about what the top would cost and there is very little profit in the business for the spinner. We quote as follows:

2/40's Australian	1.20
2/40's XX Delaine	1.10
2/40's Half Blood	1.05
2/20's Half Blood	.85
2/36's 3/8 Blood	.75
2/26's 1/4 Blood	.68

Woolen Yarn.

Spinners continue fairly busy, although there is not so much business placed as during the latter part of the year. The present is one of between seasons and manufacturers on certain lines have not yet got a fair start, but although the season is slow in starting every one is predicting a good run on all classes of manufactured goods. The weavers, although unwilling to let go the machinery space under contract are willing to allow their spinners the opportunity of securing outside business for two or three weeks until the situation clears up.

DAVENPORT PEARL BUTTON CO.
Davenport, Iowa.
Manufacturers of
PEARL BUTTONS.
New York Office, - - - - - 377 Broadway

JENCKES SPINNING CO.,
Formerly E. JENCKES MFG. CO.
Carded and Combed Cotton Yarns for Weavers and Knitters.
Double and Twist Yarns for Woolen Trade.
PAWTUCKET, R. I.

WILLIAM B. CHARLES,
Cotton Yarns,
Cotton Cloth,
Silesia, Sateens,
For the Underwear Trade.
AMSTERDAM, N. Y.

GRANT YARN CO.,
COMBED AND CARDED COTTON.
YARNS 40's and above. AND
FITCHBURG, MASS. WARPS

FLOSSETTE MILLS
of the
New England Thread Co.
CENTRAL FALLS, - - R. I.
(DYERS and BLEACHERS) and MANUFACTURERS of
High Class Threads on Tubes, Spools and Cones and MERCERIZED YARNS for Knitting.
GLAZING OF YARNS
For the Shoe Lace. TAPE and WEBBING TRADE.

C. MOORE & CO.,
Manufacturers of
TWINES, THREADS AND YARNS,
Jacquard Harness Twines of all kind on hand and made to order.
S.W. Cor. Fifth and Market Sts., Phila.

Knitting and Weaving YARNS.
Cones, Cops, Warps, Skeins,
Single, Double, Three-Ply, etc.
Peeler, Egyptian, Mixed Colors.
Large Assortment.
EDWARD S. HYDE,
226 CHESTNUT STREET,
Philadelphia, Pa.

What's the Use

of buying three or four times as much oil as is actually used for lubrication? For every drop of fluid oil which is **worn out** in reducing friction between bearing surfaces, at least three other drops either never reach the bearing in the first place, or else run through it into the goods and the floors.

The use of **NON-FLUID OILS** means free insurance against mill stains on goods, a substantial decrease in the oil bill, and — last but not least — no increase in the coal bill.

A postal will bring free testing samples by paid express.

NEW YORK & NEW JERSEY LUBRICANT CO.,
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JOSEPH M. ADAMS CO.
WOOLEN YARNS,
Carpet Backing and Rug Yarns a Specialty.
ARCOLA MILLS,
Main St., foot of Centre St., Manayunk, Phila.

Woolen and Merino Yarns,
1 to 10 Runs, at reasonable prices.
All Wool, Mohair and Wool Spun or Mixed Cotton and Shoddy Yarns, in white, gray, and colors.
Dress Goods Yarns a Specialty.
E. M. ROCKWELL, - - LEOMINSTER, MASS.

E. C. HARPER,
WORSTED and WOOLEN YARNS,
MERCERIZED COTTON,
395 BROADWAY, TEL. 1626 FRANKLIN NEW YORK.

YARNS Solis, Boston.
77
SUMMER STREET.
ANDREW J. SOLIS, Jr. & CO.

HOFFMAN, DeWITT & McDONOUGH,
Manufacturers of
Diamond Stay Bindings TRADE MARK
Tapes, Webbing and Bindings.
COTTMAN and G STS., PHILADELPHIA
Ryer's Station, P. & R. R. R.
Bell Telephone, 203 Cheltenham.

Wiscasset Mills Co. | Patterson Manfg. Co.
Efrid Manfg. Co. | Tuscorora Cotton Mill.
High Grade Hosiery Yarn
White and Colors. All Numbers.
Sewing Twine on Cones and Tubes.
SPECIALTIES IN WEAVING YARN.
Black and white. Double and twist for woolen trade.
CANNON MILLS, 55 Leonard Street, New York.

The hosiery manufacturers are still on cotton hosiery and the woolen end of the season will not begin for two months. Those knitters requiring yarn for the fleece backing of their underwear will not place these orders before the first of April. In connection with this it may be said that the knitters making fleece lined wool underwear are very busy, having had the best business known in many years. The Southern trade is exceptionally good this season. The reason for this is that the price for wool backed fleece lined underwear has not advanced, while most of the other styles with the exception of that made from Australian lamb's wool has been. The knitters of all wool flat underwear state that they could easily fill up with orders, but the orders they could secure would show them a positive loss and so many of the mills are awaiting developments. One very large manufacturer said that he had just returned from an extended trip in the West and had had fairly good success, but he had been obliged to advance the price of his goods and the buyers did not take kindly to that feature. The advance insisted upon was unavoidable as no knitter using domestic wool can afford to pay an advance of 12 to 15 cents per pound on the scoured wool and manufacture his garments at the old cost price. All the spinners complain that manufacturers are using such poor material that it is hard to get an old dollar back for a new one.

Rag and Shoddy Market.

As the heavy weight season draws to a close rag dealers show an increasing desire to dispose of stock, so as to meet the lean months of the light weight season with as little material on hand as possible. The mills for a similar reason are buying only to meet immediate requirements, which are small, as nearly all covered their orders for goods by purchases of raw material early in the season. As a result, the market for both rags and shoddy is decidedly weaker than a month ago. It is more difficult to sell stock now than when prices were higher, because then there was a demand which does not exist now. Shoddy manufacturers are buying sparingly, because new contracts for delivery of shoddy are not being made. The duplicate orders for goods are not expected to cause any material revival of the demand for stock, and the trade is looking forward to a period of quiet. A strong feature of the situation is the scarcity and high price of wool, which will unquestionably lead spinners to seek substitutes with which to meet the demands of the consumer for clothing at a price.

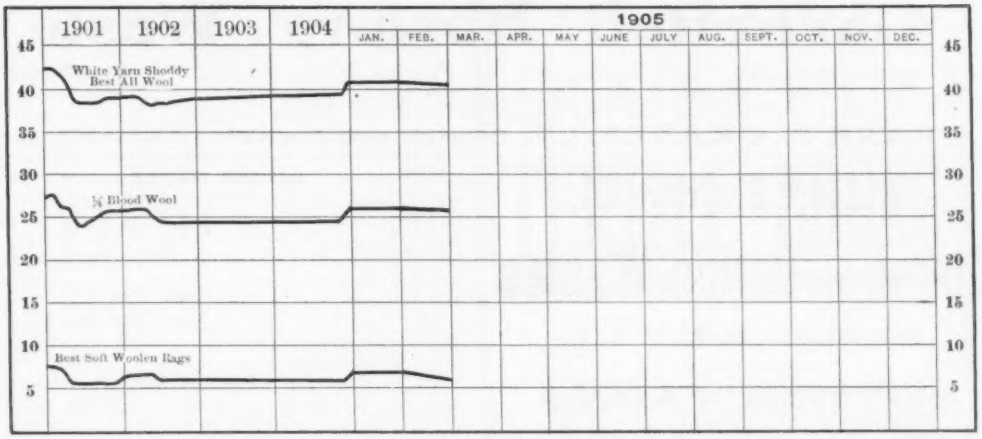

CHART SHOWING RANGE OF PRICES OF SHODDY, RAGS AND NOIL.

SHODDIES AND EXTRACTS.

White yarn, best all wool	38-40
White knit, all wool, best, fine	28-32
White knit, No. 2	23-25
Light yarn, extra fine	25-28
New pure indigo blue	23-25

Merino.

Fine light, all wool, No. 1	24-25
Medium light, all wool No,. 1	16½-17½
Medium light, all wool, No. 2	14-16
Fine black, all wool	20-22
Fine dark, all wool, best grade	20-21
Medium dark, all wool, No. 1	13-15
Medium dark, all wool, No. 2	12-13
Red knit stock, strictly all wool	19-20
Red flannel, all wool	19-20
Dark blue for hosiery, strictly all wool, No. 1	17-20
Dark blue for hosiery, not all wool, No. 2	12-14

DELAINE EXTRACTS.

Light	19-22
Medium light	15-17

WOOLEN RAGS.

Regular gray	12-13
Black	14-15
Fancy colors	16-20
Fine merchant tailors, all colors	9-11
Choice light colors	13-15
Browns	12-13
Blacks	9½-10½
Fine blues, plain	9-11
Fine dark	10-11
Medium dark	7-8

Worsteds.

Blue	16-18
Black	18-20

Serges.

New black	15-16
New blue	14-15

Flannels.

New scarlet	18½-22
New blue	17-18
Cloakings	3-4

SOFTS AND KNIT STOCK.

Soft woolens, best	7-7½
Old white flannels	14-16
White flannels, No. 2	11-12
Old red flannels	9½-10
Light blue flannels	7½-9
Old blue flannels	6-7
Fine worsted, new black	26
New blue clip, best, fine	20-22
Dark mixed yarn, extra fine	22-24
All wool yarn, medium and coarse grades	15-20
Old plaids	5-7
White stockings	17-18
White hood stock	20-21
Clear hoods	9-10
Red stockings	9-10
Blue stockings	7-8
Fancy stockings, No. 1	7-9
Gray stockings	9-10
Black stockings	9-10
Knit stock comforters	6-7½
Red knit	9-10
Light gray knit	9-10
New light fancies	16-18
New fancies	12-14

Merinos.

Light, fine	13½-15
Light, coarse	7½-8
Fine, dark	12-13
Dark, No. 2	8-9
Coarse, dark	5-6
Blue	12-13
Blue—seamed	13-14
Black—unseamed	12-13
New black	18-20
Small	3¼-4
Bunting	6-8

FLOCKS.

Shear, fine white, all wool	9-11
Fine indigo blue, all wool	9-9½
Fine black, and blue, all wool	7-8
Fine dark, all wool	5-6
Gig, fine, all wool	3-4
No. 1 black, all wool cut	6-7
All wool, fancy, shear and gig	2½-3½

Garnetted Hosiery Waste

In Cotton, Cotton and Wool Mixes, and All Wool. White and Light Colors a Specialty.

SEND FOR MONTHLY PRICE LIST.

FRANK B. GRAVES, Cor. Church and Arch Sts., ALBANY, N. Y.

WILLIAM B. CHARLES,

Cotton and Cotton Wastes

Amsterdam, N. Y., U. S. A.

COTTON YARNS.

Contracts made with Cotton and Woolen Mills for Yearly Waste Production. Correspondence solicited. Shepperson's Code, 1878. Cable Address "Charles."

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WM. H. H. SLACK & BRO.,
Springfield, Vt.

Carbonized Stock a Specialty.

FLOCKS

M. B. SCHWAB, Pres. H. RAWITSER, Treas.
ED. GLUECK, Sec. and Gen. Mgr.

RIVERDALE WOOLEN CO., MANUFACTURERS OF

.. Shoddies ..

Of every description. Capacity 7,000,000 pounds per annum. Custom Carbonizing and Garnetting a Specialty.

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You Save Enough Insurance to Pay for the Equipment.

So it costs you NOTHING to have the AMERICAN WATCHMAN'S CLOCK. Fully approved by all insurance companies. We equip factories with Fire Alarms, Signals, etc., also Employee's Time Recorders, and Telephone Systems. Electric Time System consists of Master Regulator in office with secondary electric clocks throughout the mill, insuring accurate time. Send for particulars.

Pettes & Randall Co., 150 Nassau St., New York

In Textile Mills

Warren's Pulley Cover

is the best and most economical belt slipping preventative. It is used by many of the best mills in the United States.

Any careful man can apply it.

Sufficient for 40 sq. ft., $5; 125 sq. ft., $12.
If your supply house does not sell it, order direct.

The Warren Co., Mfrs., 25 E. Chicago Ave., Chicago, Ill.

COTTON WASTE.

No. 1 Spinners	7½-8
No. 1 Machine	6-6½
No. 2 Machine	4½-5¼
Machine Cop	6½-7
No. 1 Cop	6½-7
No. 1 Card	7-7½
No. 2 Card	6½-6¾
No. 1 Oily Card	4-4½
No. 2 Oily Card	3-3½
Peeler Combing	7½-8
Egyptian Combing	Limited Quantity
No. 1 Linters	4-4½
No. 2 Linters	3½-4
White Clips	6¼-6¾
Colored Clips	4¾-5¼
No. 1 Picker	2-3

Dyestuffs and Chemicals.

Acids.

Acetic 100 lbs.	2.25-3.70
Citric, domestic	32-32½
Oxalic	5-5¼
Sulphuric, 60 deg. 100 lbs.	1.10-1.30
Muriatic, 18 deg.	1.50-1.60
Tartaric crystals	29-29¼

Miscellaneous Chemicals.

Acetate of lime, gray 100 lbs.	2.25-2.30
Alum, lump	1.75-1.80
ground	1.85-1.95
powdered	3.00-3.25
Aqua ammonia 16 deg.	3¾-4
Ammoniac, sal. gray	5¾-6
Borax, bbls.	7¾-8
Brimstone, crude, foreign ton	21¼-21½
Copperas	52½-65
Cream tartar, crystals	24½-24¾
Fuller's earth, lump, 100 lbs.	80-85
powdered	80-85
Glauber's salt	40-50
Potash, chlorate, crystals	8¼-8¾
powdered	8¾-9
carbonate	3.6-5
Soda ash, carbonate, 48 per cent.	1.25-1.50
high test	1.00-1.25
Soda, bicarbonate, English	3.50-6.00
American	1.30-1.70
Soda, caustic, domestic 60 per cent.	1.85-1.90
Sal. English	67½-70
Sal. American	60-70
Sulphate, alumina	¾-1¼
Vitriol, blue	5.15-5¼

Dyestuffs.

Acetate of soda	3½-3¾
Acid, picric, best crystals	23-25
tannic, commercial	35-37
Albumen, egg	48-65
blood	20-26
Alizarine, red	15½-16
Aniline oil	10-10½

salt crystals	8¼-9
Antimony salt, 65 per cent	10¼-11
Bichloride of tin, 50 per cent	9¼-9¾
60 per cent.	12½-12¾
Bichromate of potash, American	8½-8¾
Bichromate of soda	6½-6¾
Bisulphate of soda	1½-2
Cutch, mat	4½-6
boxes	5-8
Dextrine, imported	6¾-7½
corn	2½-3
Divi-divi ton	35.00-40.00
Flavine	23-40
Fustic, stick, ton	22.00
young root	31.00-35.00
Gambier	4¼-4¾
Hypo. of soda, Am. bbls. cwt.	1.50-1.60
Indigo, Bengal, low grade	60-67½
medium	70-80
high grade	95-1.00
Kurpah's, medium to good	55-60
higher grade	65-75
Gautemala	55-75
Manila	48-55
Madras	46-50
J. (Synthetic)	18-20
Indigotine	95-1.80
Logwood, stick, ton	16.00-23.00
roots	16.00-18.00
Madder, Dutch	7-10
Muriate of tin, 36 degrees	9-9¼
52 degrees	15-15¼
Nitrate of iron, commercial	1¼-1½
Nutgalls, blue Aleppo	25-30
Persian berries	6-7
Phosphate of soda	2¼-3
Prussiate of potash, yellow	13¼-14
Quercitron, ton	18-20
Starch, corn, pearl, bbls.	2.02
corn, pearl, bags	1.87
potato	3¾-4½
rice	6½-7½
wheat	5¼-6
Stannate of soda	12-20
Sumac, Sicily, No. 1, ton	44.00-47.00
Sicily, No. 2, ton	41.00-43.00
Virginia	37.00-38.00
Tapioca flour	1.95-2¼
Tin crystals	22-23½
Turmeric, Bengal	3-3¼
Zinc dust	5¼-7

Extracts.

Fustic, solid	8-11
liquid, 51 degrees	6¼-8
Indigo	6-10
Logwood, solid	6-12
liquid, 51 degrees	5-10
Persian berry	9-15
Sumac	3-6

*Virginia, Petersburg. The Petersburg Hosiery Co. has been incorporated with capital stock of $5,000, and will start operations about March 1, making misses' 1/1 black ribbed hose and women's 108-needle mixture. This plant was formerly operated by A. S. Reinach & Son. Of the new company, A. S. Reinach is president and F. L. Reinach treasurer. Mill is equipped with 120 knitting and 3 sewing machines.

CATALOGUE of USEFUL TEXTILE BOOKS

WE have recently published a descriptive catalogue which contains a list of all books in the English language on textile subjects that are in print and that are of present value, classified under the different subjects to which they pertain. This catalogue should be in the possession of every mill man. It will be sent free upon application. New books on textile subjects are being published frequently. We can supply any textile or technical book, whether of our own publication or not, at lowest prices. We can also give information and prices of foreign textile publications, directories, etc. We are headquarters for everything in the line of textile literature and information.

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299 DEVONSHIRE ST.
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PUBLISHERS OF THE
Textile World Record

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Manufacturers of

MERCERIZED YARNS

FOR ALL PURPOSES.

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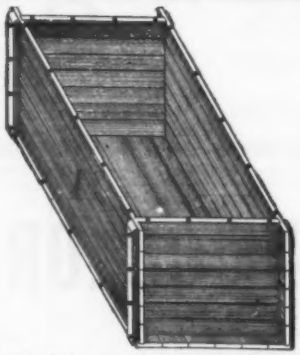

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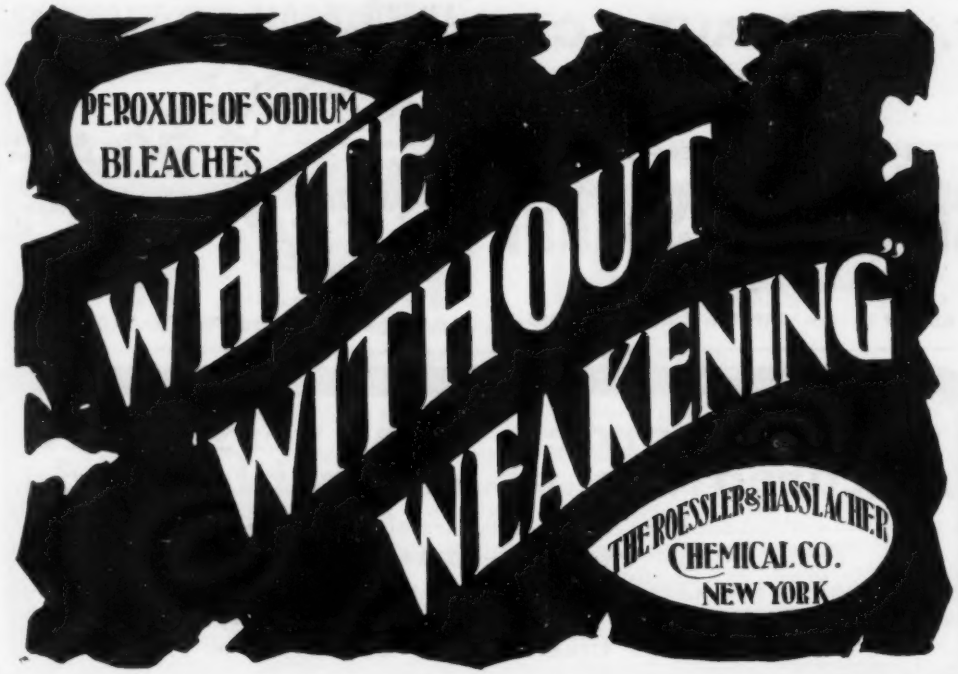
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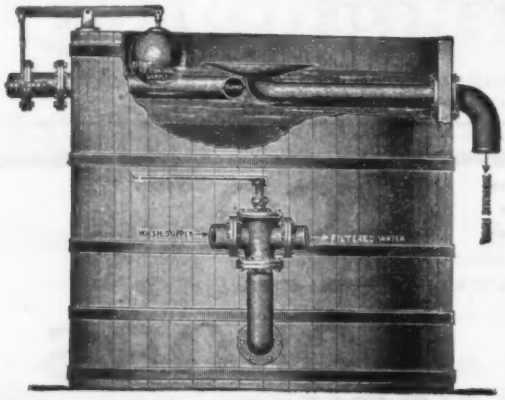

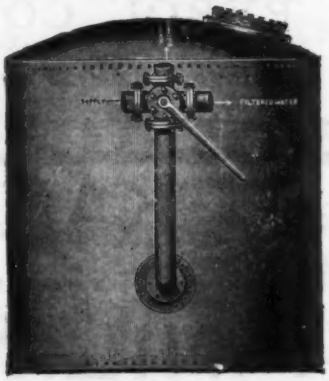

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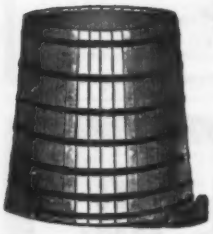

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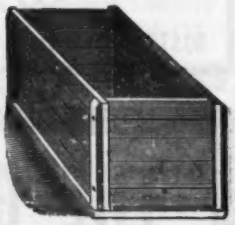

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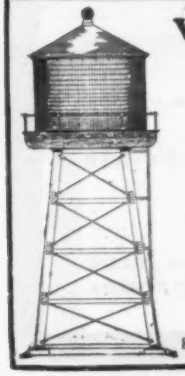

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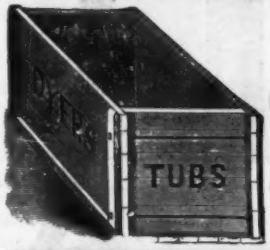

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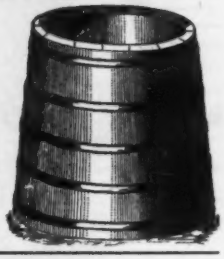

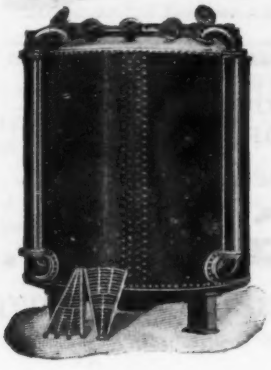

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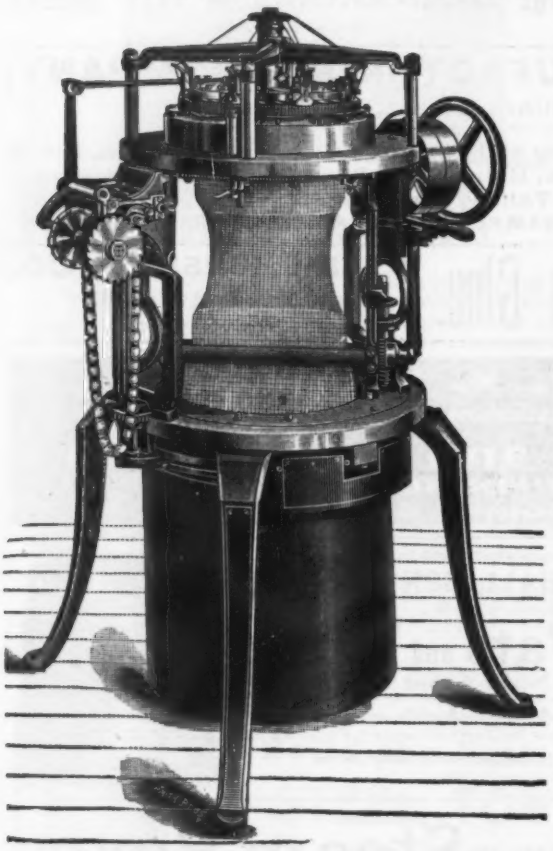

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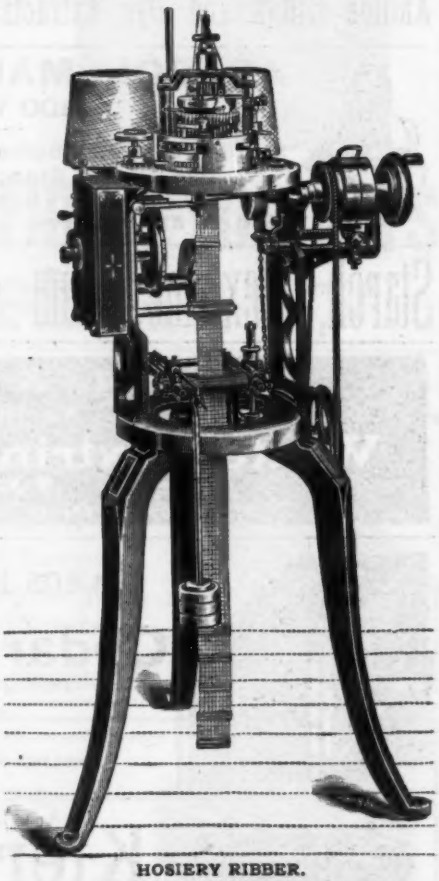

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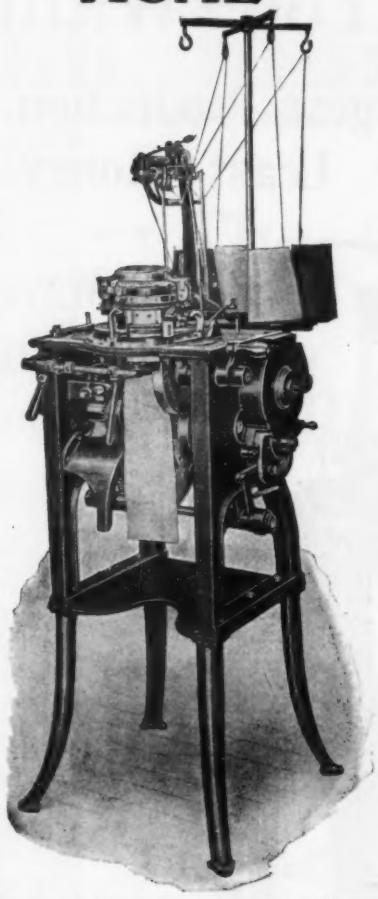

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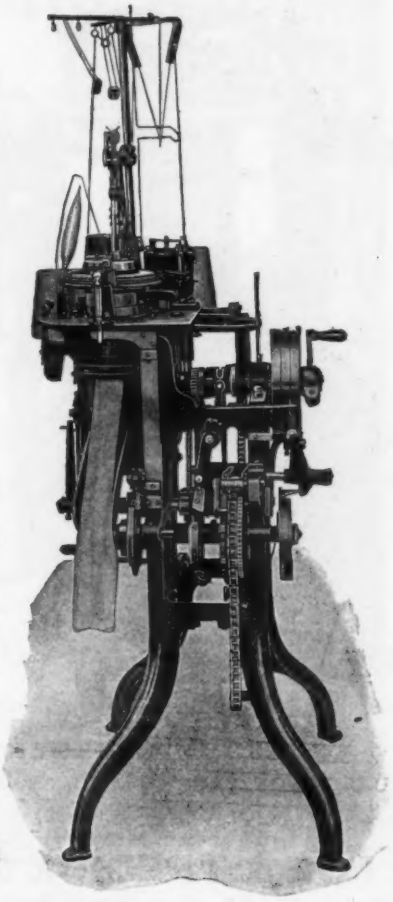

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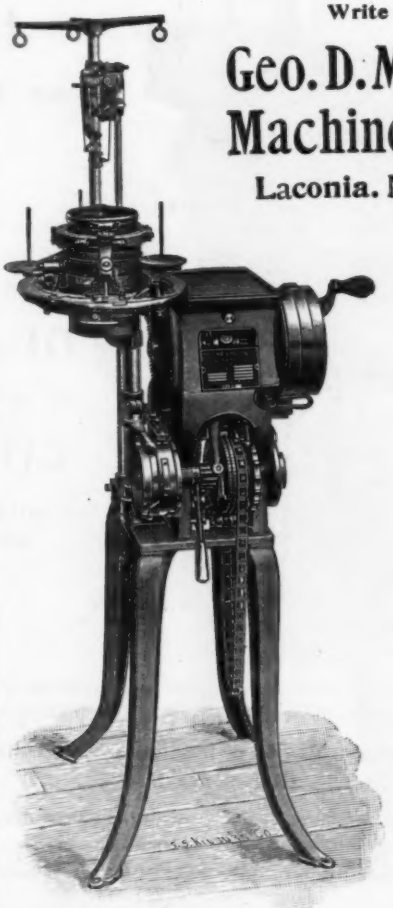

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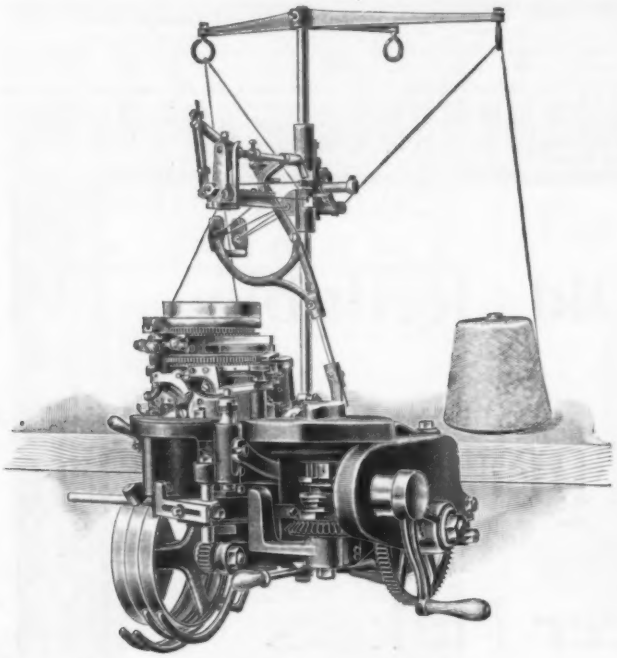

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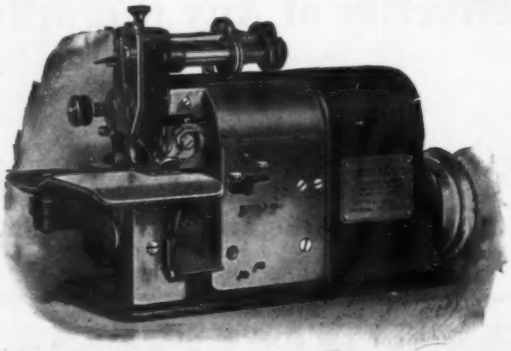

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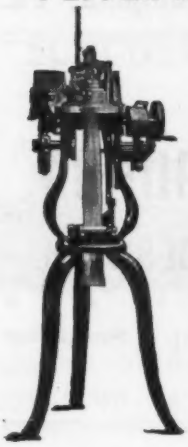


Knitting Machinery,

INCLUDING

Pepper's Flat Ribbed Cuff Machines,

Automatic Welt and Loose Course Machines for Stock Tops. New Circular Stripers with Welt, Loose Course and Striping (Automatic), for Short Cuffs, Sock Tops, Hose Legs, Wristers, etc.

Golf and Bicycle Stocking Machines,

ALL KINDS OF

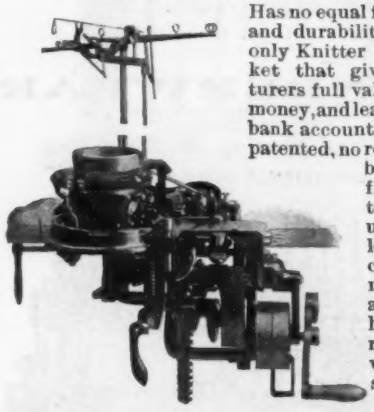
CIRCULAR RIBBED MACHINES

For Men's Underwear, Ladies' and Misses' Hose Legs and Leggins. Correspondence Solicited.

The New Improved

Boss 15/16 Automatic

KNITTER



Has no equal for simplicity and durability. It is the only Knitter on the market that gives manufacturers full value for their money, and leaves a swelled bank account. It is fully patented, no royalty to pay; built in sizes from 2½″ up to 6″; from 42 up to 220 needles in 3¾″ machine. Knits men's, ladies' and children's hose, plain or ribbed. Runs with one single belt. Automatic tension in heel and toe. Send for prices and particulars to

THE BOSS KNITTING MACHINE WORKS,

Cor. Elm and Reed Sts., Reading, Pa.

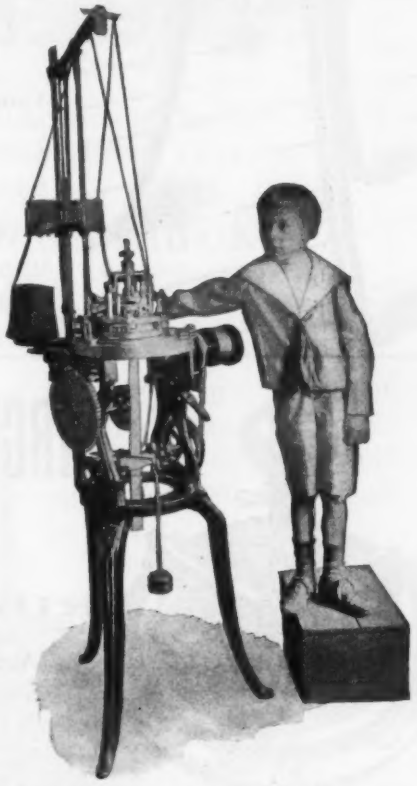
HARDENED STEEL CYLINDERS A SPECIALTY.

A FAIR PROPOSITION

If wanting to purchase Ribbers, you can try a

RUTH RIBBER and STOP MOTION

before buying to satisfy yourself that they are all right. Our STOP MOTION is a decided improvement over all others. No cutting of yarn, easy to thread. Stops from any imperfection in yarn. The movement of one lever releases brake and corrects yarn guide, when stop is caused by knot you have but one hook to thread. Very positive in its action.

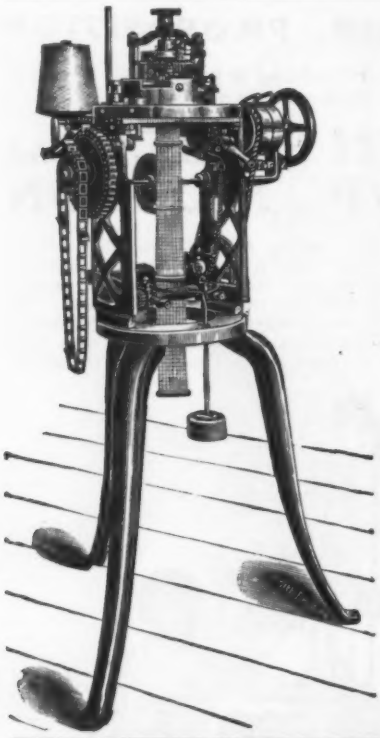


Our RIBBER is high speed, durable, simple and easy to operate, with largest production; single or double feed, plain or fancy stitch for half hose and misses goods. Large loose-course, good round welt, double knee, sleeves or cuffs. Knits wool or cotton yarn, fine or course guage. Hardened cylinders and dials for any make of machine. Best Workmanship. All products guaranteed. Can attach STOP MOTION to any style machine.

Write to-day for price lists.

RUTH MACHINE CO., York, Pa.

Address Box "N." G. W. Ruth, Manager.



H. Brinton & Co.

213-215 Race Street, Philadelphia, Pa.

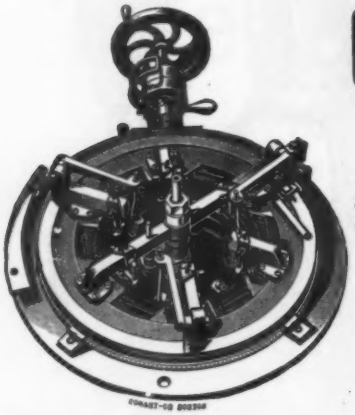
BUILDERS OF

Knitting Machinery

For HOSIERY and UNDERWEAR.

Complete Estimates Furnished. Send for Particulars.

The cut shows our **Improved Automatic Ribber** with Welt and Slack Course for Half Hose, Tops and Ribbed Legs.

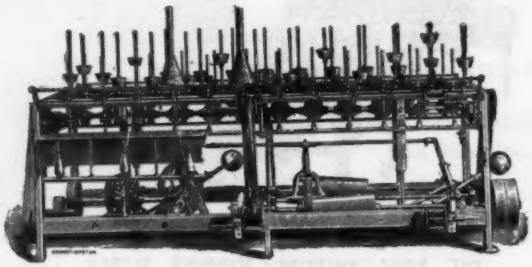


CIRCULAR KNITTING MACHINES

Either plain or full automatic, with stop motions complete. 4 to 24 feeds for

RIBBED UNDERWEAR

Automatic Racking and Striping Machines for Sweaters, Cardigans, Collarettes, Cuffs and Anklets.



ALSO BUILDERS OF THE WELL-KNOWN

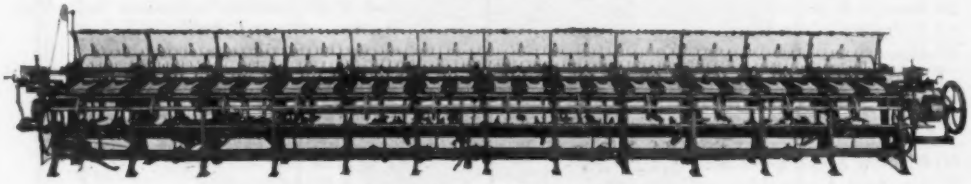
ABEL WINDERS, SEAMERS and LOOPERS.

LEIGHTON MACHINE CO., - Manchester, N. H.

FULL FASHIONED HOSIERY MACHINES

Built by

SCHUBERT & SALZER MASCHINENFABRIK,
Chemnitz, Germany.



HALF-HOSE LEGGER OF 24 SECTIONS.

All classes of flat work machines for full-fashioned hosiery in all gauges from 14 to 32 needles to one inch, from 12-24 sections.

Also Machines built by

DRESDNER STRICKMASCHINEN-FABRIK
IRMSCHER & CO.,
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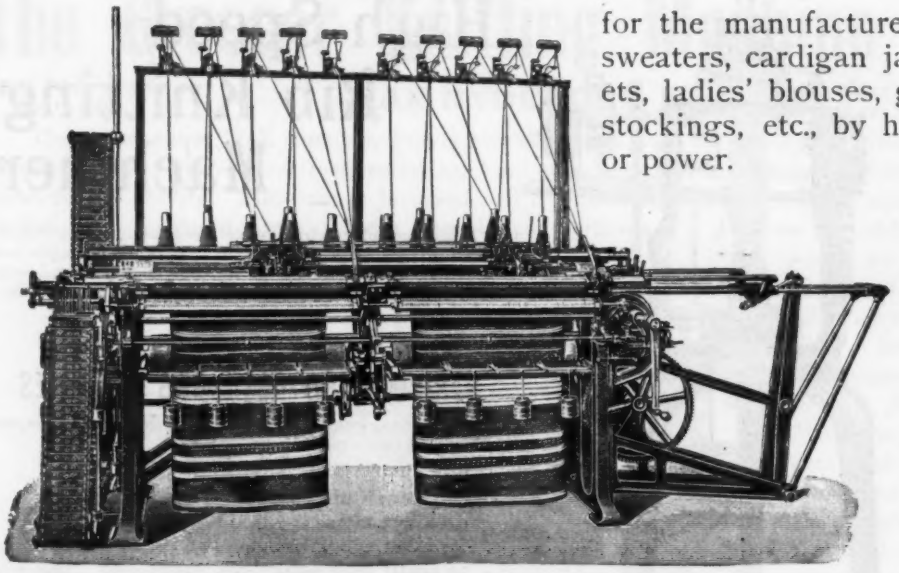


for the manufacture of sweaters, cardigan jackets, ladies' blouses, golf stockings, etc., by hand or power.

OTTO WALTHER, 591 Bourse, Philadelphia, Pa.

JAMES TAYLOR,

835 Arch Street, - - - Philadelphia, Penn.

KNITTING MACHINERY

OF ALL KINDS. NEW AND SECOND HAND.

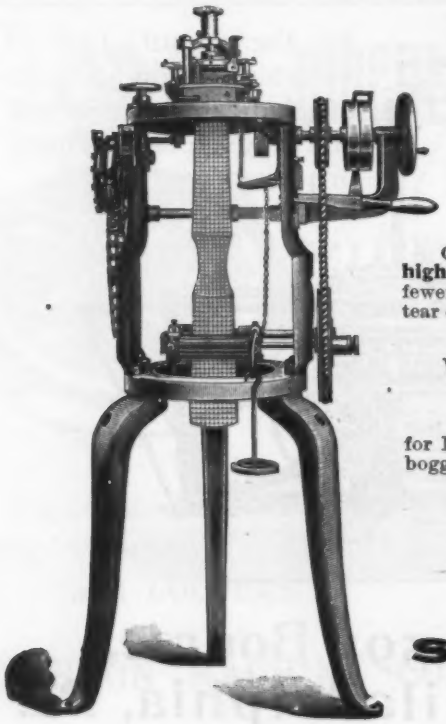
A RARE OPPORTUNITY TO BUY.

1 Complete plant; 500 per day of ladies', gents' and misses' hose. Modern mchy.
28 Beattie & Hepworth & Abel loopers.
4 Corneley embroidery machines.
10 Hosiery presses (lever).
1 14 plate Crawford press.
11 Lamb and Grosser sweater machines.
150 Ribbed underwear machines, various sizes and makes. 1 Sensitive drill.
60 Brinton & Co. ¾ aut. knitters, sizes.
27 Standard A machines.
56 Union Special machines, various styles.
1 Rotary fire pump.
10 h. p. electric motor.
100 Mayo machines. Various sizes.
100 Brooks welters.
4 Fleecing machines.
98 Brinton & Co. and other make hosiery ribbers.
30 Invincible machines, almost new.
1 40 Spindle, Easton and Burnham spooler.
40 Ribbed shirt machine cylinders and dials, all sizes, cuts and makes.
1 Smith & Drum singeing machines.
1 Small plant; 100 dozen per day, childrens' ribbed hose.
1 36-inch engine driven extractor.
1 9 plate Crawford press, 32 x 50.
2 40 Sp. Payne cop winders.
2 Lindsay & Hyde winders.
3 No. 50 Merrow machines. C. & G.
1 Grosser Jacquard machine.
3 Cyclone dryers. 2 Typewriters.
5 Band folding and cutting machines.
1 48 spindle Payne Cop winder.
1 Weyburn fabric cutter.
4 30-inch ventilating fans.

WRITE FOR COMPLETE LIST.

APPRAISEMENTS A SPECIALTY.

We are always in the market to buy good second-hand Knitting and Finishing Machinery.



High Speed Rib Knitting Machinery.

Our latest model machinery has been designed to run at **very high speed**, giving large production. This is accomplished with fewer seconds, less breakage of needles, less jar and wear and tear on machines than has been customary at lower speeds.

We also make Special

STRIPING AND DESIGNING MACHINES

for Fancy Golf Stockings, Bathing Suits, Sweaters, Toques, Toboggan Caps, Skirts, etc.

Our Machinery gives large production at low cost and enables manufacturers to meet the market always and make a profit.

STAFFORD & HOLT,

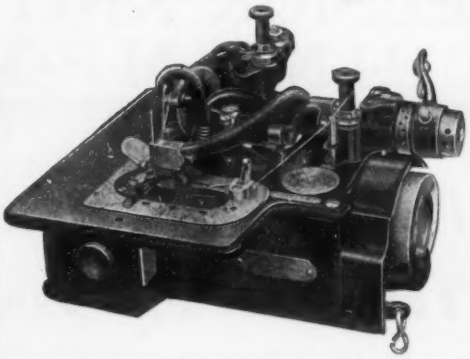
LITTLE FALLS, N. Y.

"OVERLOCK" Machine

TRADE MARK. (Pat. April 5, 1892.)

Patent twice upheld by U. S. Court of Appeals.

For Trimming, Seaming (or Hemming or Overedging) and Covering Raw Edges of Knit Underwear and Hosiery in **ONE OPERATION,** and for making "Overlock" Corded Edge on Lace Curtains, Silks, Ribbons Etc.



Extract from Report of U. S. Consul at Nottingham, Eng.

"The Overlock stitching device of Willcox & Gibbs has had a phenomenal success since the date of its introduction * * * * The keen competition among manufacturers has necessitated its use, bo h as a matter of economy and to improve the character of output for a discriminating market."

TRADE MARK.

WILLCOX & GIBBS SEWING MACH. CO. NEW YORK

Business Est. 1859.

WILLCOX & GIBBS SEWING MACHINE COMPANY

General Offices, 658 Broadway, cor Bond Street,

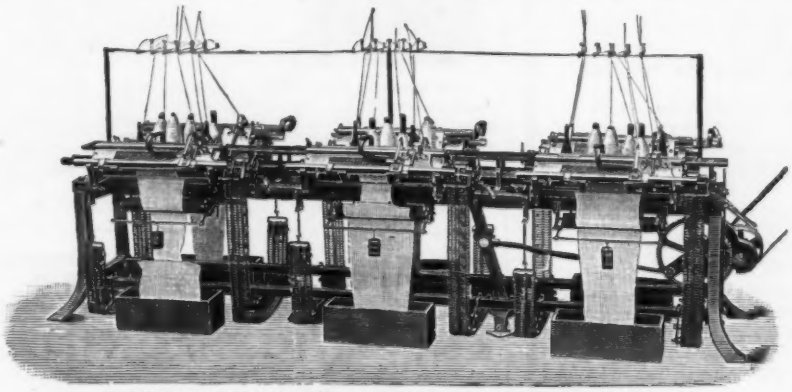
NEW YORK, N. Y.

Branches: LONDON PARIS MILAN DRESDEN

The Grosser Knitting Machine Co.

Wool Exchange Room 400 — **MAX NYDEGGER** — **260 West Broadway New York**

The ***"Grosser"*** full automatic Power Machines are always the ***cheapest,*** because ***they are the best.*** Special constructions for any kind of flat knit goods. Large Production. Machines easy to operate. The Grosser Jacquard and Shaker Machines have the best success in the market. Ask for descriptive Catalogue, Samples and particulars. ***Power Machines*** to ***be seen in Operation.*** Demonstration Rooms, Repair Shop. Largest and best assorted stock in ***Hand Knitting*** Machines, parts, needles and supplies. Promptest delivery. Special Machines for fancy gloves to be operated by girls.



"GROSSER" FULL AUTOMATIC WIDENING MACHINE, 6 SECTIONS.

Ask for prices and samples.

EXCELSIOR KNITTING MACHINE MFG. CO.

BUILDERS OF

Full Automatic Knitters

WITH OR WITHOUT

Transferring Device

ALL SIZES AND GAUGES, 2 1-4 INCH TO 4 INCH

MEADOW AND WASHINGTON STREETS ALLENTOWN, PA.

$50,000.00 Subscribed

SITE DONATED

and the citizens of one of the best communities on our line are making determined efforts to locate a cotton mill and knitting mill.

They want to get in touch with a brainy, experienced operator, who can subscribe some stock and assume active management of the plant.

The immediate section produces cotton of the finest staple; the farmers themselves have subscribed stock and are interested in the success of the venture. Cheap fuel, intelligent white labor, low rates on the finished product, are some of the attractive features.

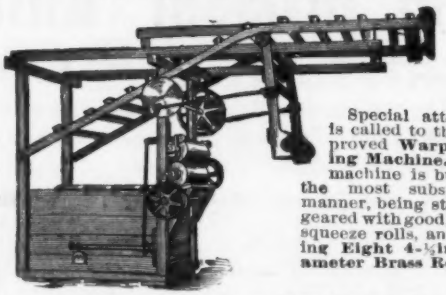
For additional information address

J. W. WHITE,
General Industrial Agent, Portsmouth, Va.

SEABOARD AIR LINE RAILWAY

If you want to move your plant South write us.

The Reliance Warp Dyeing Machine.



Special attention is called to this improved **Warp Dyeing Machine.** This machine is built in the most substantial manner, being strongly geared with good, heavy squeeze rolls, and having **Eight 4-½in. Diameter Brass Rolls.**

This machine, with our Improved Plater-down has met with marvelous success, and parties desiring machinery of this class, can make no mistake on ours For further particulars and prices, address

CHARLES HART,

Hedge and Brown Streets. FRANKFORD, PHILA.

CRANE MFG. CO. Lakeport, N. H.

Spring Needle Circular

KNITTING MACHINE.

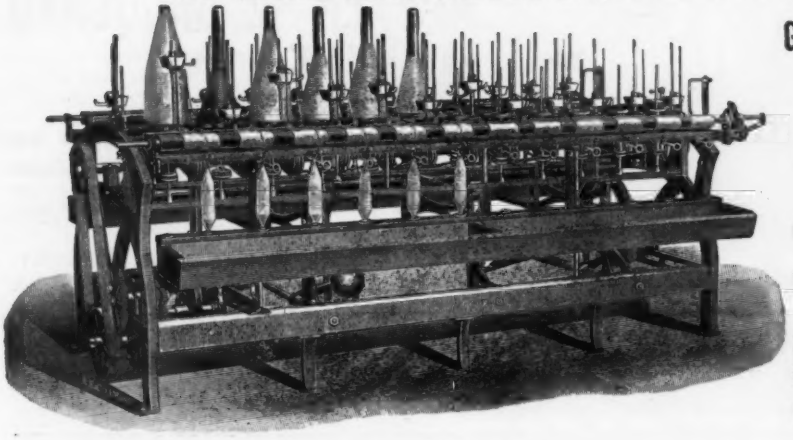
For Hosiery, Shirts, Drawers, Jersey Cloth and Stockinet.

A Specialty of Hardened Bladed Burr Wheels with Self-Oiling Brackets.

GEO. W. PAYNE, Prest. J. MILTON PAYNE, Treas. CLINTON F. PAYNE, Sec'y.

OVER 1,650 PAYNE WINDERS IN USE

For Hosiery Mfrs., Wind for Cop, Skein or Bobbin.



GEO. W. PAYNE CO.,

[Est. 1865. Inc. 1903.]

Builders of the

Improved

Upright Spoolers,

To Spool from Cop, Skein or Bobbin.

Doubling Spoolers, for doubling 2, 3, or more ends into one,

Upright Quillers, Quill from Cop, Skein or Bobbin.

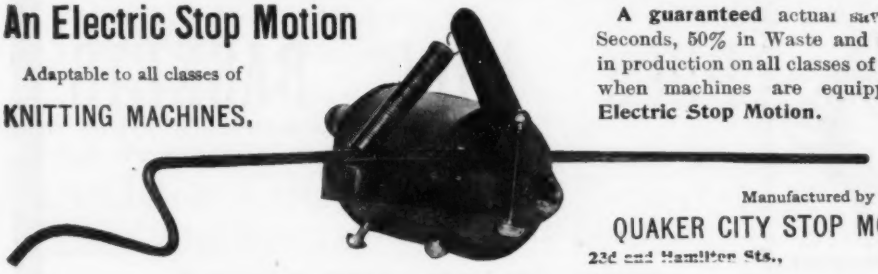
Ring Dresser, Spooler and Reel Spindles, Cop Skewers, Warp, Spool, Spooler, Guides, Bolsters and Stops Made and Repaired at Short Notice.

OFFICE, 102 BROAD STREET
Pawtucket, R. I.

An Electric Stop Motion

Adaptable to all classes of

KNITTING MACHINES.

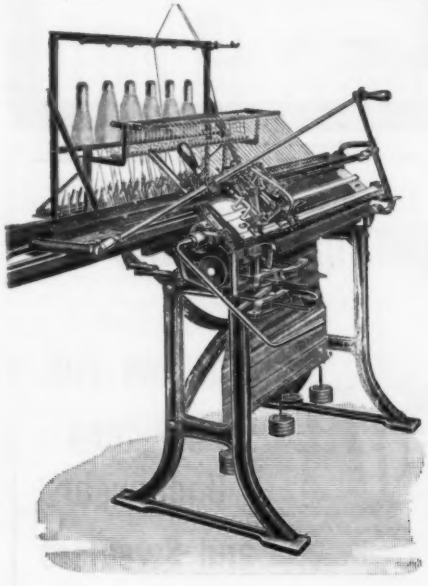


A guaranteed actual saving of 90% in Seconds, 50% in Waste and a 30% increase in production on all classes of Knitted Goods, when machines are equipped with this Electric Stop Motion.

Manufactured by

QUAKER CITY STOP MOTION CO.,

23d and Hamilton Sts., Philadelphia, Pa.



Walter & Co., Limited.

Mühlhausen i/Thür, Germany.

SPECIAL MANUFACTURERS

— OF —

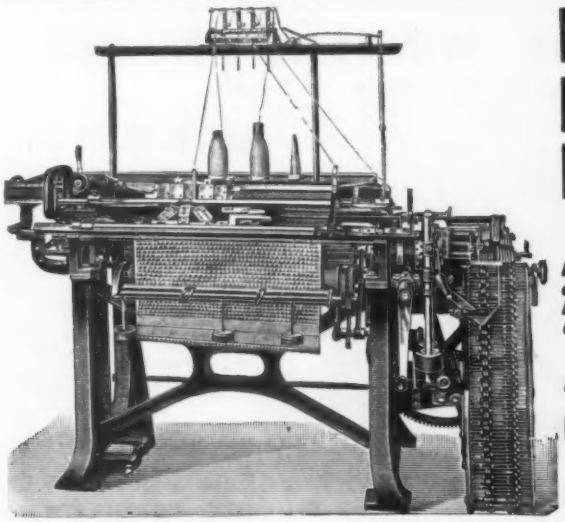
KNITTING AND WINDING MACHINES

for hand and power driving, of best quality and perfect construction.

SPECIALTY: JACQUARD MACHINES

for hand and power driving for manufacturing of sweaters and every possible fancy article of that nature.

PRICE LISTS AND SAMPLE ON APPLICATION.



Full Automatic NOPPEN & JACQUARD MACHINE

For High-Grade Sweaters, Jerseys, Etc. in latest plain and colored patterns.

Most durable, simplest construction! Easy to operate and adjust! Recognized as the Best in the market. One operator attends to 3 of these machines! Only reliable machine for above articles.

HIGH SPEED! LARGE PRODUCTION! IN USE EVERYWHERE!

Ask for samples and full particulars. State gauge and size you need.

CLAES & FLENTJE Mühlhausen, Thür, GERMANY.

Representatives: Ainslie Knitting Machine Co., Ainslie and Humboldt Sts., Brooklyn, N.Y., where all kinds of hand and power machines can be seen working.

PAT'D MORRIS TRADE MARK BASKET REG. GROVEVILLE N.J.

DUCK MILL BASKETS

If you are using baskets of any material made up partly of wood you are buying an expensive basket.

Let us prove it to you by sending you a trial order of our

STEEL FRAME DUCK BASKETS.

MORRIS & CO., Groveville, N. J.

Julius Kayser, Pres. Simon Banner, Treas.

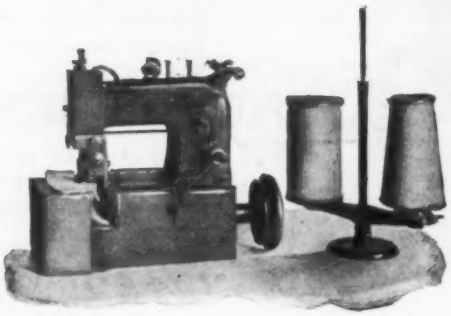
American Overedging and Seaming Machine Co.

Manufacturers of

Overedging

AND

Seaming Machines



For All Kinds of

Cut and Full Fashioned Underwear and Sweaters

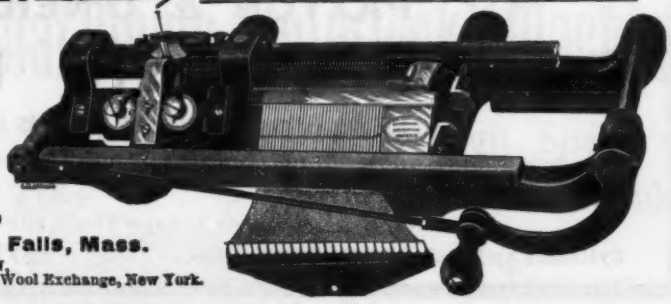
FACTORY, 543 EAST 116th STREET - - - - - - - NEW YORK CITY

The LAMB, LEADER OF KNITTERS,

Original and Still the Best.

Most widely used; being operated in every civilized country in the world. For description, prices, etc., see catalogue.

CIRCULAR MACHINES,
RIB TOP and
SEAMING MACHINES.



LAMB KNITTING MACHINE COMPANY,

P. O. Box 5888, Chicopee Falls, Mass.

J. E. WOODHEAD, 100 22d St., Chicago.
L. D. SANBORN, Room 505 Wool Exchange, New York.

CELEBRATED BRAND PYRAMID LACINGS

For Underwear, Overshirts and Sweaters,

JOHN CATHCART & CO.,

115 Franklin Street, NEW YORK.

LACINGS

FOR OVERSHIRTS and UNDERWEAR.

Tipped and Tasseled.

Hepner & Horwitz, 30 Howard St., N. Y.

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MANUFACTURER OF

Knitting Machinery

Flat and Circular Rib, both Spring and Latch Needle, Plain Circular Machines, Lead or Trick Cylinder. **Spring Needle Cylinder Rib-Top Machines**, for making Cuffs, Drawer Bottoms and Shirt Borders. **Spring and Latch Knitting Needles, Burr Wheels, Burr Blades, Sinkers, Jacks, etc.**

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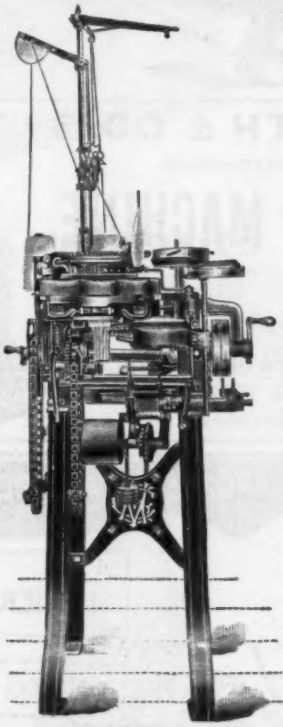
European Representatives,
MOSES MELLOR & SONS, Ltd.
Nottingham, England.

C. J. SIBBALD, General Representative, 757 River St., Troy, N. Y.

We Know How

TO BUILD HOSIERY MACHINERY

That's Why There Are More Standards



in use than any other make.

Have you seen the new Standard F?

It will produce from **30%** to **50%** more goods than any other machine on the market.

Hosiery manufacturers are invited to inspect it in our show rooms.

ARE YOU INTERESTED?

STANDARD MACHINE CO.,
508 Ludlow Street,
Philadelphia.

PAXTON & O'NEILL'S

3-4 AUTOMATIC KNITTER

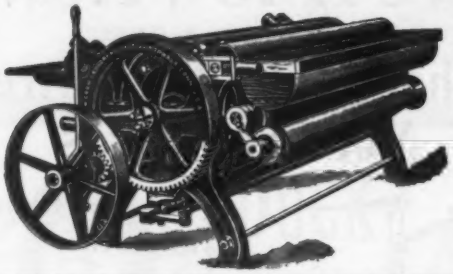
FOR ALL KINDS AND GUAGES OF SEAMLESS HOSIERY.

Has the preference wherever used over 7-8 and full automatics. Because it makes as much or more goods and better goods. Costs less for repairs. Gives less trouble to fixers. Range on Half Hose, from the coarsest to 360 needle.

Exclusive rights to BROWN'S ATTACHMENTS FOR LACE EFFECT.

Cylinders and Dials for all size Machines. **127 Bread Street, Phila.**

AUTOMATIC IRONING and PRESSING MACHINE for KNIT GOODS.



This machine irons and presses ribbed and flat underwear, giving a fine, smooth finish and most attractive appearance to the goods, not to be obtained in any other way. It does not break buttons. Inexpensive and easy to operate, and has large capacity. Knitting mills using them are greatly pleased with results. This method of finishing is sure to come into universal use. Send for further particulars to

J. W. CRAW LAUNDRY MACHINERY CO.,
SOUTH NORWALK, CONN.

HEPWORTH & CO.'S

Patent Single-Stitch

LOOPING MACHINE.

Needle working from the inside, avoiding the breaking of needles and points and picking-up the metal.

Single and Double Stitch, or Both Combined.

JOHN W. HEPWORTH & CO.,
N. W. Cor. Lehigh Ave. and Mascher Street,
PHILADELPHIA.

Drying Forms.

BOARDS FOR FAST BLACK DYERS.

HOSIERY FINISHING BOARDS.

BEST WORK. PROMPT SERVICE. PRICES ALWAYS RIGHT.

JOS. T. PEARSON 1815-21 TAYLOR ST. KENSINGTON PHILA

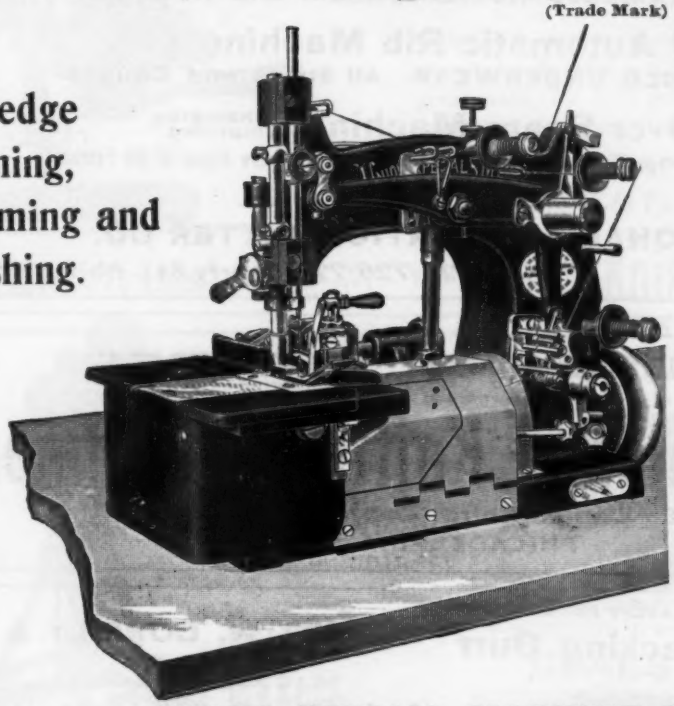
Hosiery Boards.

High Speed and Most Durable Mechanism are the Essential Elements of Machines to Produce Sewed Articles. We have these Elements in the

New Union Special Single "Interlock" Machine

(Trade Mark)

For Overedge Seaming, Hemming and Finishing.



High Speed Class 15400.

Two or Three Thread Stitch.

Simplicity.

Durability.

UNION SPECIAL MACHINE CO.

75 E. Kinzie Street, Chicago.
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A. McMICHAEL,

Machinist,

Repairs to Hosiery and Underwear Machines, Cylinders and Dials of every description.

FINE MACHINE WORK.

22 Armat Street, near Main, Germantown,

PHILADELPHIA, PA

We HARDEN all CYLINDERS and DIALS large and small.

Hegeman Seamless Bobbin Cover.

The best, cheapest and most satisfactory covering for winder bobbins. Will fit on any style or size.

FRANK E. KOLB,
MILL SUPPLIES
Amsterdam, N. Y.
SOLE AGENT FOR
Adams' Patented Latch Needles

SMALL RIB MACHINES
CROCHET MACHINES

NATIONAL

SHELL STITCH
MACHINES

Spring Beard Needle Machine
For SEAMLESS HOSIERY, Plain and Novelties

Automatic Rib Machine
For RIBBED UNDERWEAR. All Styles and Gauges

Over Seam Machine "Champion, Improved"
For Welting Seamless Hosiery. Covering Raw Edges of Rib Fabrics.

NATIONAL AUTOMATIC KNITTER CO.
SEND FOR FULL PARTICULARS
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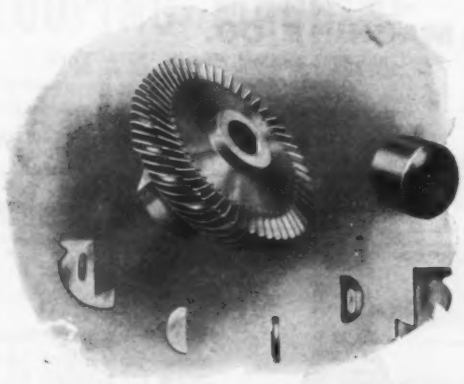
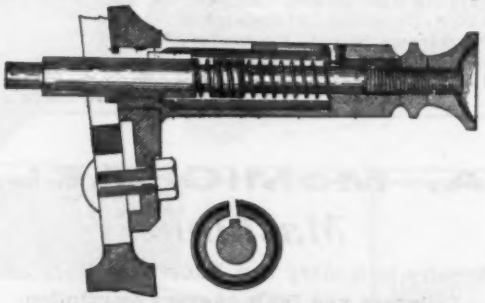
WOLFGANG RICHTER,
Importer and Builder of
Full Fashioned Knitting Machinery
N. E. Corner Third and Green Streets,
PHILADELPHIA, PA.

TOMPKINS LATEST IMPROVED **Backing Burr**



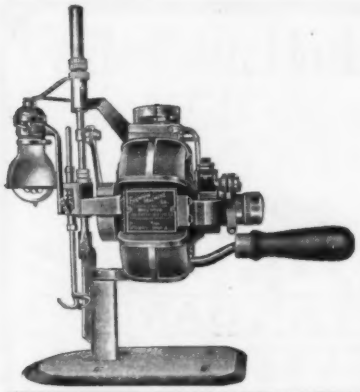
Tompkins Bros. Co., Troy, N. Y.
Circular Spring Needle Knitting Machinery.

ROBERT W. GORMLY & CO.
TROY, N. Y.
BUILDERS OF
Spring Needle Knitting Machinery



PATENT BURR STAND TUBE
The cheapest and best on the market with more and simpler adjustment than any other make.

WILLIAM C. BULL, BENNINGTON, VERMONT.
MAKER OF
For Ladies', Gents', and Children's Goods.
LATEST STYLES.
BEST WORKMANSHIP.
Drying Form Boards
OF EVERY VARIETY.



Two Cutters Saved

For every three employed. In other words, the

Eastman ELECTRIC Cloth Cutter

with ONE operator does the work of THREE expert hand cutters. It is being used on a great variety of knit fabrics. If you employ more than one cutter, we have a money making proposition to offer you. Write for particulars.

Eastman Mch. Co., 41-43 East Eagle St., Buffalo, N. Y.

An Effective Label

well put on, wire costing one cent per 1000 stitches.

Complete Outfits of

Printers Machinery

Book Binders Machinery

Paper Box Makers Machinery

An extract from purchaser's letter:

Gentlemen:—
Since using your Brehmer Wire Stitching Machine, we have impressed on each garment over 2000 dozen at a cost of only 40c. outside the price of machine. Whereas the same amount of pin-fastners would have cost us $33.20.

STAR KNITTING CO., Cohoes, N. Y.

Chas. Beck Paper Co., Ltd.,
609 CHESTNUT ST., PHILADELPHIA, PA.

LEWIS JONES,

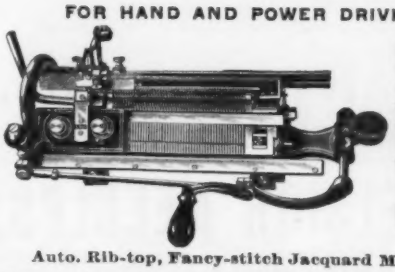
60½ and Media Streets, . . . PHILADELPHIA.

GAS ENGINES for city or country
BRUSHING MACHINERY
KNITTING MACHINERY

EFFICIENT
DURABLE
LOW IN PRICE

Best Knitting Machines

IMPROVED CONSTRUCTION
FOR HAND AND POWER DRIVING.



High Speed, Excellent Workmanship.

Auto. Rib-top, Fancy-stitch Jacquard Machines.

Everywhere in work. **80,000** Machines sold.

CLAES & FLENTJE,
Mühlhausen, Thür, Germany.

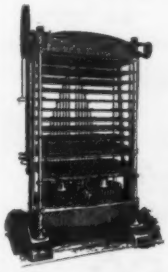
Agents for the East: Ainslie Knitting Machine Co., Ainslie and Humboldt Sts., Brooklyn, N. Y.
Agents for the West: Logan Knitting Factory, Logan, Utah.

The CRAWFORD

HOLLOW STEAM

PLATE PRESS

For Knit or Woolen Goods.



The most reliable machine of the kind on the market.

PRESS PAPERS and FENDERS.

SPENCE & RIDEOUT,
Successors to
J. J. CRAWFORD & SON,
NASHUA, N. H.
Established 1868.

BUTTONS

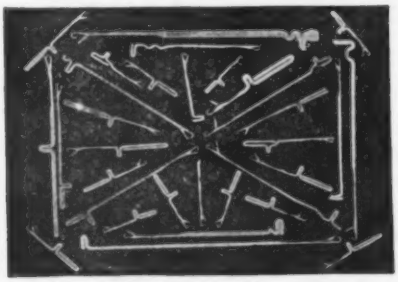
ALL KINDS OF BUTTONS
Fine Specialties for Fancy Knitting Trade.

WRITE US FOR UP TO DATE SAMPLES.

INTERNATIONAL BUTTON CO., Rochester, N. Y.
NEW YORK OFFICE, 826-828 BROADWAY.

TRY OUR "SUPERIOR" OR SUNKEN RIVET-HEAD NEEDLES

They will save you money.



Dodge Needle Co., Manchester, N. H.

WM. COREY CO.,

Manufacturers of Knitting Machine

Latch Needles,

MANCHESTER, N. H.

EXCELSIOR NEEDLES.

The best Hosiery Needles in the market.

Manufactured by

WARDWELL NEEDLE CO., Lakeport, N. H.

W.M. BREEDON'S SON,

MANUFACTURERS OF

Spring Knitting Needles

AND BURR BLADES OF ALL KINDS.

AMSTERDAM, - N. Y.

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MANUFACTURER OF

Screw Riveted Balmoral and Double Rib

NEEDLES

(Patented May 6, 1890.)

All Work Guaranteed. **MANCHESTER GREEN, CONN.**

L. T. IVES CO.

Manufacturers of all kinds of

SPRING KNITTING NEEDLES

NEW BRUNSWICK, N. J.

Standard Latch Needles

MANUFACTURED BY

EXCELSIOR NEEDLE CO.,

TORRINGTON, CONN.

The Largest Manufacturers of Machine Needles in the World.

STANDARD

TRADE MARK.

Longer Wear. Better Work.
Less Mending. Fewer Seconds.

Have you tried our

Patent Milled Rivet.

Agents

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Manufacturers' Supplies Co., 418 Arch St., Phila.
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J. C. Strittmatter, 2a Calle de San Francisco No. 9, City of Mexico, Mexico.

Manufacturers' Supplies Co.

418 ARCH STREET, PHILA.

Needles and Supplies for Knitting Mills.

Agents for EXCELSIOR NEEDLE CO., and NATIONAL NEEDLE CO.

PAGE NEEDLE CO.,

MANUFACTURERS OF

LATCH NEEDLES

of all kinds. Warranted in every respect.

CHICOPEE FALLS, MASS.

Agents: J. E. Woodhead, 100 Twenty-second Street, Chicago, Ill. Durbrow & Hearne Mfg. Co., 12 Wooster Street, New York. James Taylor, 835 Arch Street, Philadelphia, Pa.

KNIT FABRICS CUT TO LENGTH.

Our Knit Fabric Cutter

will cut from the roll, knit fabric into any length from 10″ to 40″ at the rate of 100 pieces a minute. The lengths are accurate, the waste is a minimum, the labor unskilled.

We also make a Slitter

for cutting these goods into narrow strips and re-winding same into rolls.

SAMUEL M. LANGSTON,

Manufacturer of Paper Box Machinery. **Ninth above Market Sts., Camden, N. J.**

LOWELL TEXTILE SCHOOL

SCIENTIFIC and practical training in all processes of textile manufacture, including all commercial fibres. Regular courses three years. Special students received in Mechanical and Electrical Engineering, Chemistry and Dyeing, Decorative Art, and Textile Design, Carding, Spinning, Weaving and Finishing. For free catalog and terms address

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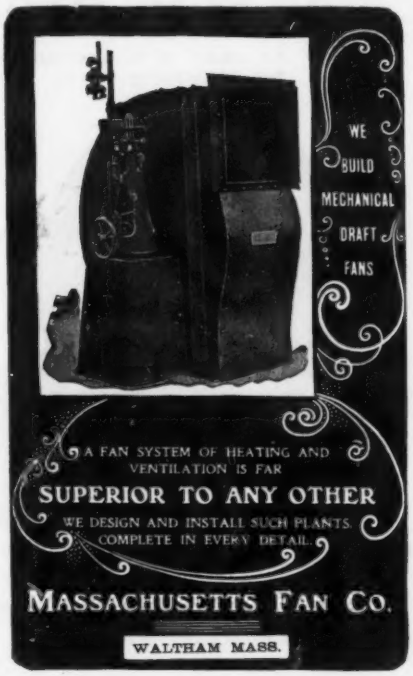
LOWELL, MASS.


WE BUILD MECHANICAL DRAFT FANS
A FAN SYSTEM OF HEATING AND VENTILATION IS FAR
SUPERIOR TO ANY OTHER
WE DESIGN AND INSTALL SUCH PLANTS COMPLETE IN EVERY DETAIL.
MASSACHUSETTS FAN CO.
WALTHAM MASS.

PHILADELPHIA Textile School

TWENTY-FIRST YEAR.

Oldest in America. . . .
Most Complete in the World.

Endorsed by the leading Educators and Manufacturers.

Cotton, Wool, Worsted and Silk

Instruction given in Designing, Weaving, Carding, Spinning, Chemistry, Dyeing and Finishing.

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Day Classes open October 3rd, 1904.
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Special Courses in Textile Chemistry and Dyeing.

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Day and Evening Instruction in . . .

PICKING, CARDING, COMBING AND SPINNING, WARP PREPARATION AND WEAVING, DESIGNING, KNITTING CHEMISTRY AND DYEING.

CATALOGUE ON APPLICATION.

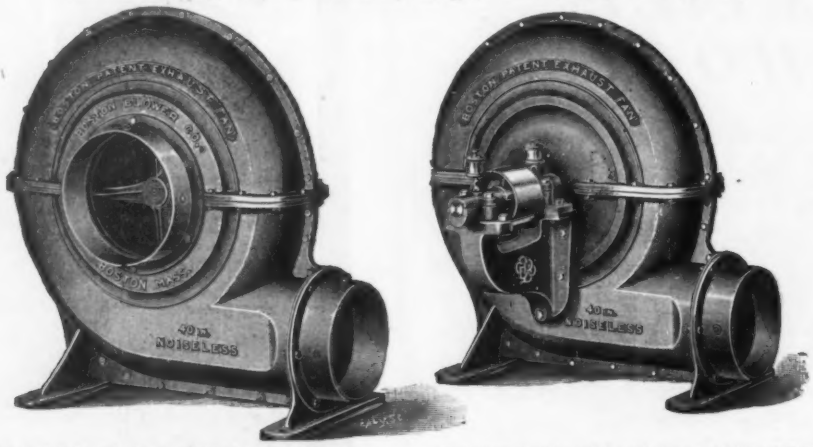
Address

New Bedford Textile School

NEW BEDFORD, MASS.

Boston Wool Exhausters, with Removable Tops.

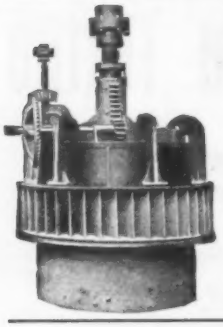
As used in Connection with Pneumatic Conveyor System for Handling Wool, Cotton, Rags, Excelsior, Jute, etc.



Inlet Side of Right-hand Wool Exhauster. **Pulley Side of Left-hand Wool Exhauster.**

This machine is similar in design to the regular Boston Patent Exhaust Fan, but is fitted with a special wheel for handling fibrous materials, and the top is removable.
This latter feature is especially desirable when handling wet or greasy materials or in handling anything, in fact, which would leave a deposit on the inside of fan, as the entire top may readily be removed for inspection or cleaning without disconnecting either pipe or belt connections.

BOSTON BLOWER CO., Main Office and Works: **Business and Glenwood Sts., HYDE PARK, MASS.**



Risdon=Alcott Turbine Co.

MOUNT HOLLY, NEW JERSEY, U. S. A.

RISDON CELEBRATED TURBINE
ALCOTT HIGH DUTY TURBINE

On Horizontal or Vertical Shafts.

These Turbines are recognized as the most effective water wheels made. Your inquiries should come direct to us for this class of machinery.

SAMSON TURBINE

An EVEN and REGULAR SPEED under all CHANGES of LOAD makes the SAMSON especially desirable for driving all classes of machinery where the output must be UNIFORM in TEXTURE and QUALITY.

Write Department A-5 for Catalogue.

The James Leffel & Co., SPRINGFIELD, OHIO, U. S. A.

CHARLES H. SCHNITZLER,
Patentee and Sole Manufacturer of
THE PNEUMATIC CONVEYOR

For the handling of wool and cotton stock, rags, excelsior, jute and all kinds of fibrous material, wet or dry. Also spool elevators, steam heating and ventilating, and mill work generally. Blower and fan work a specialty. This conveyor is patented. Beware of infringement.

SATISFACTION GUARANTEED. Patented Oct. 15, 1889.

215 NORTH SECOND ST., - PHILADELPHIA, PA.

G. Bickelhaupt Skylight Works

Sole Manufacturers of
G. B. TRADE MARK SPECIALTIES.

SELF-LOCKING SCUTTLE OPENER.

Skylight Lift and Skylights.

Established 1869. Send for pamphlets.

243-245 N. 47th Street, - NEW YORK.

Water Wheel Governors

For TEXTILE MILLS

We Guarantee Satisfaction.

Replogle Governor Works

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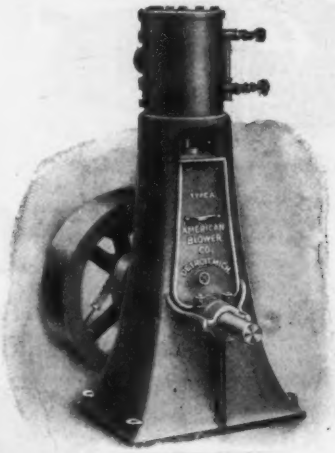
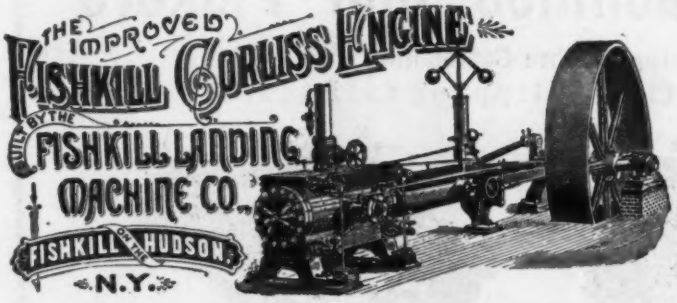
NEW AND NOVEL



Every working part of this Engine runs in oil, automatically supplied by a pump in base. Send for descriptive circular.

FANS and BLOWERS for all purposes.

AMERICAN BLOWER COMPANY
DETROIT



Most Efficient and Economical Power in the world For Textile Mills.

It has NO EQUAL for Close Regulation and Noiseless Operation. Send for Catalogue.

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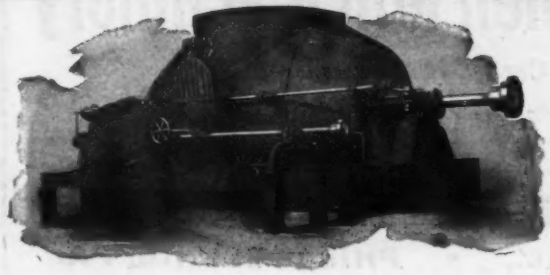
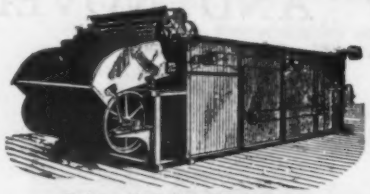


4,000 H. P., 72 ft. head, arranged to drive generator and a single turbine to drive exciter. Five settings built for the Hudson River Water Power Company's Spier Falls plant and 14 pairs 51 inch for their plant at Mechanicsville, N, Y.

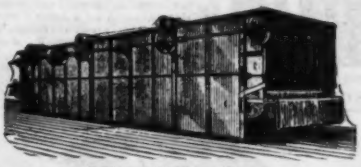
Write for Catalogue if contemplating purchase of turbines.

S. MORGAN SMITH CO.
YORK, PA.
Boston Office, 176 Federal Street.

MAR 15 1905



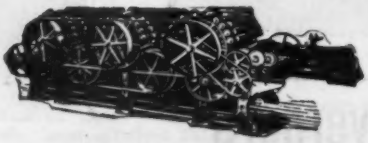
Automatic Cotton Stock Dryer.



Automatic Yarn Dryer.

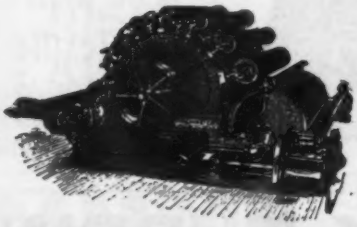
"CYCLONE" DRYERS

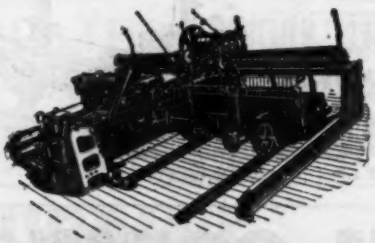
For Cotton Stock, Wool Stock, Rags,
Yarn, Cloth, Underwear, Stockings, Etc.



"PROCTOR"
Garnett Machines and Pickers

For reducing to fibre Cotton and Woolen
Waste, Cloth Clippings, Etc.





"FURBUSH" Woolen Mill Machinery

Including Pickers, Cards, Mules, Twisters,
Warpers, Dressers, Spoolers, Etc.

Manufactured by

THE PHILADELPHIA TEXTILE MACHINERY CO.,

Hancock and Somerset Sts., - PHILADELPHIA, PA.

I have a list of actual experiences of Advertisers in many lines who have proven to *their* satisfaction that

The Butterick Trio

paid them better as an advertising medium than any other publication or combination of publications.

BUSTER BROWN is going to GIVE AWAY THIS
$1,650.00 Acme Automobile
DO YOU WANT IT?
Read how to get it—
MESS. DEULIN & CO.
CHICAGO, ILL.
DEAR FRIENDS:
Buster Brown Stockings for Boys and Girls at 25c. per pair
THEY DON'T GET HOLES
ARE THE BEST IN THE WORLD
FAST, BUT THEY WON'T RUN
You can go out and wear 'em, but you can't wear 'em out
Any Child can Make Faces
Easter Egg Painting Outfits
Write me a letter. Your friend.
BUSTER BROWN, 346 Broadway, New York

This is a reduced reproduction of the fourth consecutive full page of The Buster Brown Stocking Co. appearing in The Butterick Trio this year. Their contract calls for full pages throughout the year, and it amounts to $30,180.

Their results are *real* results for *they made the money!* A good deal of this success was due to "know how"—in which I helped.

I'd like to tell you how they did it, and I think I can tell you also how you can do it!

It looks to me as though this was an opportunity for you to look into the successful experiences of others *in your own line*—and then to judge for yourself. I'll not try to decide for you.

And the information I have for you is so much too valuable to charge for, that it's quite free—to you.

THOMAS BALMER, Advertising Manager

THE BUTTERICK TRIO { The Delineator / The Designer / New Idea Woman's Magazine

Circulation, 1,500,000. Rate, $7.12½ a Line

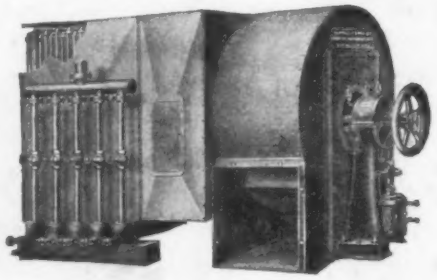
Butterick Building, New York 200 Monroe St., Chicago

THE NEW FOSTER WINDER

OPEN WIND from start to finish of cone.
No press-offs from knots, no flattening of yarn.
The only perfect system of winding yarn.
for knitting purposes.

TUBE WINDERS, SKEIN WINDERS, DOUBLERS.

FOSTER MACHINE COMPANY,
WESTFIELD, MASS.



Economical — Efficient — Reliable

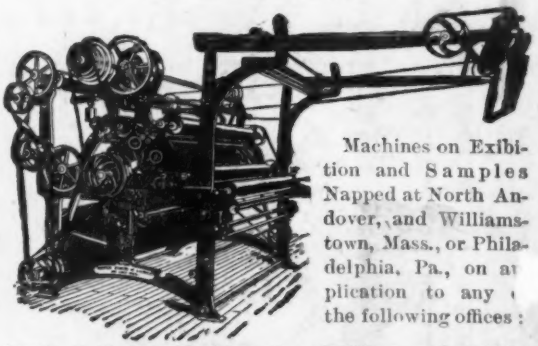
THE BUFFALO
FAN SYSTEM

Of Heating — Ventilating — Drying and Humidity Control
Used by America's Foremost Textile Mills. *Send for List*

Buffalo Forge Company
BUFFALO, N. Y.

THE AMERICAN NAPPING MACHINE CO.

Own the principal patents on Napping Machines, representing the latest French, English and American Patents.



Machines on Exibition and Samples Napped at North Andover, and Williamstown, Mass., or Philadelphia, Pa., on application to any of the following offices:

Davis & Furber Machine Co., Builders and Selling Agents, North Andover, Mass.
Geo. S. Harwood & Son, 53 State St., Boston.
C. J. Jones, Salesman, No. 160 West Lehigh Avenue, Philadelphia, Pa.

H. H. HEAP, Treasurer and General Manager.
WILLIAMSTOWN, MASS.

Walworth Manufacturing Co.,
HIGH PRESSURE
VALVES AND FITTINGS

"Walmanco" Pipe Flanges,
"Never Stick" Blow-off Cocks, Mill Supplies.

GENERAL OFFICES:
132 FEDERAL STREET, BOSTON, MASS.
New York Office: Park Row Building.

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